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More Than Three Million Tons.

STOCKS OF IRON ORE ON LAKE ERIE DOCKS EXCEED THOSE OF 1896 BY 1,300,000 TONS—CONSUMPTION 2,000,000 TONS LESS THAN DURING THE PREVIOUS YEAR.

Stocks of ore on Lake Erie docks aggregate 3,256,479 gross tons, or 1,306,799 tons more than was on dock May 1, 1896. Shipments from Lake Erie docks to furnaces since the close of navigation foot up only 1,698,487 tons, against 2,466,014 during the winter of 1895-96, while the shipments for the full year ending May 1, 1897, aggregate only 6,719,633 tons, against 8,805,510 tons during the year ending May 1, 1896. In other words, the consumption of ore during the year just closed by furnaces supplied from docks along the shore of Lake Erie, from Toledo to Buffalo, is full 2,000,000 tons short of what it was in the previous year, and reports from Chicago would indicate that there has been a proportionate shrinkage in consumption at that point, where heavy stocks are also carried over. This is the main cause of inactivity in the ore business.

Official returns have been received by the Marine Review from all managers of Lake Erie docks. At the close of navigation on Dec. 1, 1896, the stocks on dock amounted to 4,954,984 tons. If we deduct from this 3,256,497 tons, the amount now on dock, we find that shipments to furnaces from Lake Erie ports during the past winter amounted to 1,698,487 tons, which, added to 5,021,146 tons, the amount shipped to furnaces during the season of navigation in 1896, gives 6,719,633 tons as the entire consumption of ore from Lake Erie docks during the year ending May 1, 1897. During the year ending May 1, 1896, the consumpion from Lake Erie docks was 8,805,510 tons, and during the previous year, ending May 1, 1895,it was 6,296,215 tons. The following tables give full details of stocks and shipments to furnaces for several years past :

IRON ORE ON LAKE ERIE DOCKS—GROSS TONS.

PORTS.	Opening of Navigation.			Close of Navigation.		
	May 1, 1897.	May 1, 1896.	May 1, 1895.	Dec. 1, 1896.	Dec. 1, 1895.	Dec. 1, 1894.
Toledo	66,337	10,593	32,625	115,959	113,332	96,157
Sandusky	48,939	8,442	67,542	59,491	34,375	77,004
Huron	162,292	55,173	80,864	200,075	101,000	147,632
Lorain	180,605	118,820	185,306	231,288	224,264	223,733
Cleveland	979,703	506,693	718,753	1,419,311	1,200,792	1,441,785
Fairport	480,984	346,847	371,730	773,905	605,470	660,980
Ashtabula	926,865	636,254	787,566	1,441,666	1,301,302	1,439,119
Conneaut	207,034	112,406	128,823	275,800	292,460	199,365
Erie	153,261	137,826	212,643	355,222	335,718	454,233
Buffalo	50,477	16,644	57,128	82,267	207,199	94,239
Total	3,256,497	1,949,698	2,642,980	4,954,984	4,415,712	4,834,247

IRON ORE ON LAKE ERIE DOCKS, MAY 1 OF EACH YEAR FOR TEN YEARS PAST.

Year.	Gross Tons.	Year.	Gross Tons.
1888	703,720	1893	2,095,797
1889	588,753	1894	2,588,370
1890	936,228	1895	2,642,830
1891	2,662,223	1896	1,949,698
1892	1,537,188	1897	3,256,497

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, FULL YEARS.

Year ending—	Gross Tons.	Year ending—	Gross Tons.
May 1, 1897	6,719,633	May 1, 1894	4,870,488
May 1, 1896	8,805,510	May 1, 1893	6,102,125
May 1, 1895	6,296,215	May 1, 1892	5,802,496

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, DURING WINTER PERIOD, DEC. 1 TO MAY 1.

Winter of—	Gross Tons.	Winter of—	Gross Tons.
1896-97	1,698,487	1893-94	1,512,340
1895-96	2,466,014	1892-93	2,053,654
1894-95	2,191,267	1891-92	1,971,301

Lake Freight Matters.

Representatives of several of the leading ore sales agencies of Cleveland are now in Chicago arranging sales of ore. They canvassed the lake freight situation before leaving and they are proceeding on a basis of 70 cents lake freight from the head of Lake Superior for the full season and 65 cents for the short season. It is more than probable that they will be ready to close up some contracts with vessel owners during the latter part of this week or early next week. It is not probable that the amount of ore to be covered by contract immediately will be very large, and an attempt may even be made to lower the figures quoted above, but it is not the disposition of all of the companies to do this. The reported charter of the steamer Senator at 50 cents for summer months from Marquette, which had a very depressing effect on the freight situation, is not closed. Owners of the vessel wanted special conditions in the charter as to loading and unloading, and this prevented a settlement of the contract, which would certainly have admitted of little, if any, profit without special dispatch.

With the exception of an occasional cargo of grain at Chicago at very low rates, and some soft coal for Lake Superior and Lake Michigan ports at 20 and 25 cents, there has been, up to this time, nothing offered to the large fleet of ships on the lakes that have no connection with ore companies or the regular lines. Probably not more than a dozen "wild" charters for the movement of ore have been made since the opening of navigation, and these are at rates so low—40 cents from Escanaba and 50 cents from Marquette—that they are certain to act more to the disadvantage of the ore business than to the vessel owners who have been forced to accept such rate. The one great drawback to the situation in ore is the surplus of stocks on dock carried over from last season. It has been understood for some time past that these stocks were heavy, but the reports, showing a reduction in consumption during the past year of full 2,000,000 tons, and an increase of 1,300,000 in stocks, are probably more discouraging than was expected. Vessel owners, who have been waiting from day to day for sales of ore and something in the way of negotiations for season contracts, are again talking of a concerted movement to hold their ships in port until June 1, but the probability of some ore contracts being made within the next few days will discourage these plans, and anyhow the experience of the past in matters of this kind gives little encouragement of success with such a movement at present.

Considerable interest is manifested in the performance of the new Wolvin steamer Crescent City, to which the Chicago Ship Building Co. has applied quadruple expansion engines and Babcock & Wilcox water tube boilers. It is a little early yet to say much of the ship, but in view of the fact that her engines were built with limited machine shop facilities in Chicago, and under adverse circumstances otherwise, she seems to have made an excellent start. The Crescent City is now bound down from Duluth with a mixed cargo of grain—one of the largest ever moved from Lake Superior. She left the Chicago yard April 24, going direct to Duluth. Referring to the departure of the steamer from Chicago, Mr. W. I. Babcock, general manager of the Chicago company says: "Our Mr. Penton went up on her as far as the 'Soo,' and reported that the engine worked splendidly in every particular, no water being used on anything and turning up to about eighty revolutions. There was some little trouble with leaky gaskets on the purifiers, but everything else went first rate. It will probably not be in order to say much of her performance until she has made a trip or two."

The car dumping machine of the Cuddy-Mullen Coal Co., Cleveland, a few days ago transferred 5,500 tons of bituminous coal from cars to the Bessemer line steamer James Watt in ten hours and thirty minutes.

Appointments of captains and engineers for 1897, vest pocket size, $1.00. Order from the Marine Review, Cleveland, Ohio.

Less than a Mill per Ton per Mile.

COST OF MOVING FREIGHT TO AND FROM LAKE SUPERIOR DURING 1896—A FURTHER BIG INCREASE IN THE VALUE OF FREIGHT PASSING THROUGH THE CANALS AT SAULT STE. MARIE.

Again the cost per ton per mile of moving freight to and from Lake Superior has been reduced to ninety-nine hundredths of a mill. This figure, covering the business of 1896, is the same as that which prevailed in 1894, a year of low freights. In 1895, when fall freights reached high figures, the average was 1.14 mills. As usual, the miles-ton report of 1896, which is a general discusison of the canal statistics, is very interesting. The figures relate to the traffic of both canals (United States and Canadian), and the increase over previous years in the amount and value of freight is very large. In 1895 the value of all freight was $159,575,129.43. In 1896 it was $195,146,842.49, or an increase in round numbers of $35,500,000. In all cases tons mean net tons of 2,000 pounds.

From the column of largest cargoes it is ascertained that there were 135 steamers that carried in their largest load 2,000 tons and upwards, and these 135 cargoes aggregated 336,300 tons and averaged 2,491 tons. There were thirty steamers which carried in their largest load 3,000 tons and upwards, aggregating 100,924 tons and averaging 3,364 tons; fourteen that carried in their largest loads 4,000 tons and upwards, aggregating 61,756 tons and averaging 4,411 tons; and seven that carried in their largest loads 5,000 tons and upwards, aggregating 36,132 tons and averaging 5,162 tons. There were thirty-three sail vessels or tow barges that carried 2,000 tons and upwards, aggregating 81, 283 tons and averaging 2,463 tons; thirteen that carried 3,000 tons and upwards, aggregating 42,628 tons and averaging 3,279 tons; seven that carried 4,000 tons and upwards, aggregating 32,607 tons and averaging 4,658 tons, and four that carried 5,000 tons and upwards, aggregatng 21,270 tons and averaging 5,318 tons.

The greatest number of miles run during the season is to the credit of the steamer Kearsarge of the Inter-lake Transit Co. of Cleveland O., and amounted to 47,709 miles. The greatest amount of freight carried by a single vessel during the season is to the credit of the steamer Victory of the same company and aggregated 96,877 net tons. The greatest number of miles-tons for the season is to the credit of the steamer Centurion of the Hopkins Steamship Co., of St. Clair, Mich., and amounted to 80,359,417. The largest single cargo carried by a steamer during the season is to the credit of the Queen City of the Zenith Tranpsortation Co. of Duluth, and amounted to 5,376 net tons. The largest single cargo carried by a sail vessel during the season is to the credit of the steel tow barge Aurania of Cleveland, and amounted to 5,850 net tons.

TABLE SHOWING ESTIMATED VALUE OF FREIGHT THROUGH UNITED STATES AND CANADIAN CANALS AT SAULT STE. MARIE DURING THE SEASON OF 1896.

ITEMS.	Designation.	Quantity.	Price per unit.	Valuation.
Coal, anthracite	Net tons	397,210	$ 4.75	$ 1,886,747 50
Coal, bituminous	Net tons	2,626,130	2.50	6,565,325 00
Flour	Barrels	8,882,858	3.85	34,199,003 30
Wheat	Bushels	63,256,463	.75	47,442,347 25
Grain (other than wheat)	Bushels	27,448,071	.39	10,704,747 69
Manufactured iron	Net tons	93,924	50.00	4,696,200 00
Pig iron	Net tons	27,948	13.50	377,298 00
Salt	Barrels	237,515	.75	178,136 25
Copper	Net tons	116,872	200.00	23,374,400 00
Iron ore	Net tons	7,909,250	3.25	25,705,065 00
Lumber	M. ft. B. M.	684,986	12.50	8,562,325 00
Silver ore	Net tons	240	112.00	26,880 00
Building stone	Net tons	17,731	10.00	177,310 00
Unclassified freight	Net tons	520,851	60.00	31,251,060 00
				$195,146,842 49

The average value per ton of freight for the season of 1895 was $10.60, and for 1896, $12.02. The foregoing estimates are the result of a discussion obtained from private information and a careful comparison with market reports. The comparisons show that there was an increase in the valuations last year over 1895 in hard and soft coal, flour, wheat, pig iron, iron ore and lumber, and a decrease in the valuation of grain other than wheat. Cereals amounted to 47 3-10 per cent. of the total freight passing the canals.

The total cost of freight transportation in 1896 was $13,511,615.80. In 1895 the cost was $14,238,758.02. The nature of the data from which this was found is such that it includes the cost of loading and unloading. The average distance freight was carried in 1896, 836.4 miles, is the highest average distance until that time. In 1895 the average was 830 miles. The average cost per ton for carrying freight was 83.2 cents.

MILES-TON REPORT, SEASON OF 1896—COST OF CARRYING FREIGHT TRANSPORTED THROUGH UNITED STATES AND CANADIAN CANALS AT SAULT STE. MARIE.

ITEMS.	Unit.	Quantity.	Price per unit.	Amount.
Coal	Net tons	3,023,340	$ .32	$ 967,468 80
Flour	Barrels	8,882,858	.11	977,114 38
Wheat	Bushels	63,256,463	.02½	1,581,411 57
Grain (other than wheat)	Bushels	27,448,071	.02¼	617,581 60
Manufactured iron	Net tons	93,924	1.40	131,493 60
Pig iron	Net tons	27,948	1.05	29,345 40
Salt	Barrels	237.515	.15	35,627 25
Copper	Net tons	116,782	1.95	227,900 40
Iron ore	Net tons	7,909,250	.82	6,485,585 00
Lumber	M. ft. B. M.	684 986	1.80	1,232,974 80
Silver ore and bullion	Net tons	240	2.33	559 20
Building stone	Net tons	17,731	1.50	26,596 50
Miscellaneous mdse.	Net tons	520,851	2.30	1,197,957 30
Total cost				$ 13,511,615 80

NOTE.—The total amount of freight paid was $13,511,615.80, which divided by the total "unit tons," 13,582,641,886, gives the cost per mile per ton as 99 100 mills. The average distance freight was carried was 836 4-10 miles, which is 6 4-10 miles more than in 1895.

The total number of registered craft using the canals during 1896 was 859, of which 509 were steam and 350 sail. Tonnage and value of these vessels, together with the number of passengers which they carried, will be found in the following table :

AMERICAN CRAFT.

Class.	No.	Registered Tonnage.	Freight Tonnage.	Passengers	Valuation of vessels.
Steamers	467	495,362	11,392,046	20,421	$35,151,400
Sails	325	231,376	4,195,623		7,854,800
Total	792	726,738	15,587,669	20,421	$43,006,200

CANADIAN CRAFT.

Class.	No.	Registered Tonnage.	Freight Tonnage.	Passengers	Valuation of vessels.
Steamers	42	21,364	486,043	16,645	$1,887,300
Sails	25	12,700	153,460		248,000
Total	67	34,064	639,503	16,645	$2, 35,300

Unregistered American craft carried 3,629 tons of freight through the canal, while the freight carried by unregistered Canadian craft amounted to 8,260 tons. Adding this latter item to the freight carried by registered Canadian craft we have a total of 647,763 tons moved through the canals in Canadian vessels, or only 4 per cent. of the whole. Summarizing the foregoing for the two canals we have :

Total number of registered craft.....859
Total passengers by unregistered craft while carrying freight 210
Total freight carried by registered craft, tons.....16,227,172
Total freight carried by unregistered craft, tons.....11,889
Total passengers.....37,066
Total valuation of craft registered.....$45,141,500

The total passages for the season amounted to 18,615, and 1,141 of these were by seventy-two crafts under 100 tons register, their aggregate registered tonnage being 1,977 and their average tonnage 28 tons; the freight carried by these crafts during the season amounted to only 276 tons.

It is found by the discussion of the reports of the watchmen stationed at the head and foot of the United States canal that vessels were delayed at the canal during the season 28,828 hours, or an average of 1 hour and 33 minutes. It appears from the records, also, that the railroad swing bridge across the canal did not delay navigation in a single instance during the entire season, nor was the passage of trains delayed by boats.

Appointments of captains and engineers for 1897, vest pocket size, $1.00. Order from the Marine Review, Cleveland, Ohio.

Finding Bottom in the Sault River.

As had been expected, vessels are finding shoal spots in the Sault river, and the first to be reported are in the immediate vicinity of the new canal lock. Capt. Daniel Buie of the Wilson line steamer Yuma sends a strong letter of protest to his owners from Buffalo, where he has just deliverd a cargo of grain from Fort William. His vessel was drawing, it is claimed, not more than a fraction of an inch over 16 feet when she passed through the canal. He says:

"Coming down the Sault canal this time the Yuma struck and rubbed heavy on the miter sill of the guard gate. This striking was caused from filling the lock, which lowered the water in the canal about 18 inches. Some regulations governing the filling of the new lock should certainly be put in force; otherwise there will be considerable damage inflicted this year to vessel property in the canal, that will more than offset all the supposed advantages of the patrol service below the canal. After I got out of the lock and when in the jaws of the canal piers, about 1,500 feet, more or less, below the lock, the vessel again struck bottom. It is, of course, expected by everybody that there is plenty of water at this point. We rubbed heavy. I will examine the bottom as soon as unloaded. It is a burning shame to think that this government work should be pronounced all right, and the channels declared open to deep-laden vessels, when a pile of unknown rock is left directly in the middle of this important channel and just about a stone's throw from what we are told is the greatest lock in the world. There are obstructions just below the Canadian lock, but the people over there are interested enough in the welfare of vessel property to tell us of the dangerous spots and also to put stakes on them."

Official Trial of the Annapolis.

FIRST VESSEL OF LARGE TYPE IN THE UNITED STATES NAVY TO BE EQUIPPED WITH ALL WATER TUBE BOILERS—THEY ARE OF THE BABCOCK & WILCOX TYPE.

The trial of the Annapolis, the first finished of the six composite gunboats ordered by the government in the early part of 1896, took place on Long Island sound April 22. An account of the trial from official sources has just been received. The Annapolis was constructed at the Crescent Ship Yard, Lewis Nixon manager, Elizabethport, N.J., and although her contract was the last given out she was the first boat finished. This vessel is 204 feet long, 36 feet wide and 22 feet 3½ inches deep. Her displacement is 1,090 tons on a draught of 12 feet. As this is the first vessel of large type in the United States navy to be equipped with all water tube boilers, a report of the trial will prove especially interesting. The bureau of steam engineerring has heretofore preferred the use of water tube boilers in connection with those of the Scotch type, but after repeated investigations and at the request of the constructors, Babcock & Wilcox, all forged steel boilers were adopted for both the Annapolis and Marietta.

This type of boiler is so well known that it will be unnecessary to enter into a description of it, other than to say that all the tubes are straight and placed on an angle of 15 degrees with the horizontal. The tubes are expanded at their ends into forged steel headers, which are provided with openings opposite the end of each tube, through which a thorough examination of the tubes can be made and the tubes cleaned and renewed. By means of a steam jet inserted between the headers, all soot deposits can be removed from the exterior of the tubes. Surmounting the sections of tubes is a steam and water drum, 42 inches diameter and 10 feet long. All openings leading into and out of the drum are 4 inches in diameter, insuring an absolutely free circulation of steam and water and a steady water line. Steam to 200 pounds pressure can be raised from cold water in half an hour, this being a most important feature in boilers for a warship. The steam supplied to the engines was absolutely dry, not a drop of water being found in the separator at the end of trial.

The Babcock & Wilcox boilers in the Annapolis are built for a working pressure of 250 pounds to the square inch, there being two in number, supplying steam to a triple expansion engine having cylinders 15, 24½ and 40 inches diameter, and a stroke of 28 inches. Specifications for the boilers called for a total of 3,600 square feet of heating surface and 94 square feet of grate, giving a ratio of about 38 to 1, the contract speed to be 12 knots and indicated horse power 800. From the performance of the boilers on the builder's trial it was shown that over 900 I. H. P. could be developed under natural draft, although the funnel is very short. On the official trial, forced draft in the ash pit was used, each boiler supplied by air from independent Sturtevant fans, the average air pressure in the ash pit being limited to one inch of water. The following table gives the steam, air pressure and speed in knots:

Time.	Boiler Pressure.	Draft pressure in ash pit, inches.		REMARKS.
a. m.	Pounds.	Port.	Starboard.	
9:00	220	.78	.68	
9:15	220	.85	1.10	
9:30	230	1.10	.65	
10:00	223	.92	.70	
10:15	225	.55	.71	
10:30	223	.82	.82	
10:45	225	.98	.85	
10:49	.....	.....	.....	Passed 24-knot stake boat and turned for home.
11:00	223	.92	.91	
11:15	218	.76	1.15	
11:30	232	.65	1.10	
11:45	222	.91	.80	
12:00	224	1.00	.80	
12:15	222	1.12	1.20	
12:30	232	1.00	1.00	Indicated horse power, main engine, 1,319.
12:45	234	1.20	1.20	
12:47	240	.....	.....	Full speed until 1 p. m., to complete four-hour trial.
Average	226	.90	.91	

SPEED TRIAL, 48 KNOTS.

Stakeboat.	Knots.	Time.		Speed in knots.
		Min.	Sec.	
Cactus				
Markeeta	6	26	27	13.7
Iwana	12	27	1	13.3
Cutter	18	27	18	13.2
Leyden	24	28	10	12.8
Cutter	30	28	17	12.7
Iwana	36	26	00	13.8
Markeeta	42	25	49	14.0
Cactus	48	25	2½	14.20

Average speed, 13.43 knots per hour.
Maximum speed, 14.18 knots per hour.
Minimum speed, 12.7 knots per hour.

The maximum indicated horse power developed by the main engine was 1,400, the average being 1,320 at 147 revolutions per minute. The collective indicated horse power will average about 1,360. The maximum speed was 14.2 knots and the minimum 12.7. This low figure occurred through the pilot losing sight of the Leyden's cutter on the first six-mile leg of the return course John Patterson, Cramp's veteran engineer, was aboard as a guest. He declined to be a guest and turned up in the engine room in overalls before the trial was fairly started. His great ambition was to get up fire enough to burn the paint off the smoke stack. The new water-tube boilers foiled him. The combustion in them was so complete that the smoke stack refused to become hot, whereat Mr. Patterson, who had seen thirteen trial trips, beginning with the Vesuvius in 1889, marvelled but was satisfied. When the end of the "four hours at full speed" test was reached the helm was put hard to port and to starboard without reducing the speed, and the little vessel made circles with a diameter of 400 feet. In turning she heeled only 3.5 degrees.

Before leaving the Annapolis, Commodore Dewey said that he was going to send this telegram to the secretary of the navy: "Annapolis trial most satisfactory; speed 13.43." "It is not customary and hardly proper," said the commodore, "to use adjectives in such despatches, but really, this time it cannot be helped. She deserves them."

The proposition to use the Pintsch system of gas lights in stationary light-houses, or towers, that are to mark the new Grosse point cut suggests the idea that before long the government may find it advisable to dispense with light keepers, especially in isolated places, and use this system. It would seem that such a plan is at least worthy of consideration.

A new lead for deep sea sounding carries a cartridge which explodes on touching the bottom. A submerged microphone receives the sound, and the depth is estimated from the time occupied by the lead in sinking.

Appointments of captains and engineers for 1897, vest pocket size, $1.00. Order from the Marine Review, Cleveland, Ohio.

Old Revenue Cutters.

The old revenue cutter Johnson, which is to be sold at auction in Cleveland shortly, had just come into port, and a party of veterans in the Perry-Payne building, Cleveland, were swapping reminiscences. Thomas Fitzpatrick was one of them. He is among the oldest of Cleveland vessel owners, but still gives attention to the management of a couple of ships. "I was engaged as an engineer on the lakes," he said, "when the Andrew Johnson, with three other wooden vessels, the Fessenden, Sherman and John A. Dix were built in 1864. John Sherman, who has always been a great friend of the revenue cutter service, secured an appropriation of $1,000,000 for the service at the time. The Johnson and Dix were built in Buffalo, and the Fessenden and Sherman on the old river bed in Cleveland by the late E. M. Peck and Stephen Kirby. Stephen Kirby, who is now living in New York, is the father of Frank E. Kirby and F. A. Kirby of the Detroit Dry Dock Co. The beam engines of both the Sherman and Fessenden were built by Fletcher & Harrison of New York, now the W. & A. Fletcher Co., and they were of a very substantial kind, involving the best of workmanship. I was engineer of the Sherman for seven years and saw the machinery taken out of her. It was first put into the side-wheel steamer Alaska, owned by J. P. Clark of Detroit, and is now in the side-wheeler Frank E. Kirby, which holds the record for the fast runs between Detroit and Put-in Bay. The engines of the old Fessenden are in the steel steamer of the same name, which is still in the revenue cutter service on the lakes. The hull of the Sherman, which was used as a lumber barge, was sunk only a short time ago in the vicintity of the Detroit river by collision with one of the steamers of the Wilson line. The John A. Dix is in Chicago, boarded up and practically abandoned, after having served as an excursion boat since leaving the revenue cutter service."

The large single-sheet chart of Georgian bay, just issued by the British admiralty, was prepared from the surveys on which Staff Commander J. G. Boulton, R. N., has been engaged for several years past. This chart may be had from the Marine Review for $1.75. The price is higher than is usually charged for navigators' charts, but this one takes the place of probably ten sectional charts and is corrected up to date.

Lower Lake Huron Cut.

With the completion of all parts of the new 20-foot cut at the lower end of Lake Huron, it would seem that the light-house officials should take some steps to have this channel properly lighted. It is quite generally agreed that the best aids to navigating the channel would be new range lights properly located on Point Edward. The vessel interests, can not be expected to undertake this expense, in addition to numerous private lights which they are already maintaining in other places, but it is more than probable that if the United States light-house officials will take up this matter with the Canadian marine department they will be able to induce the dominion officials to provide funds for the erection and maintenance of suitable range lights on Point Edward, which would not be very expensive.

In the meantime it may be well to direct the attention of vessel masters to present conditions. Col. Lydecker says that, as the entire channel for a width of 2,400 feet has been completely dredged, there is no longer any necessity of vessels holding so closely to the Canadian, or eastern side of the cut. He says that vessel masters insist on doing this on account of their experience before the channel was completed, although they are now taking chances of getting over too far and striking the last bank. This danger is increased, he says, by the fact that in a westerly or northwesterly gale the lightship stationed to mark the upper entrance of the cut is likely to be carried too far to the east and thus misguide the pilot. In order to swing easily in the seas she hangs on a very long chain, and can be carried far enough to deceive the pilot, who sticks to that side too closely. At the same time the light-ship will not deceive he says, if vessel masters bear in mind the width of the channel and use it accordingly.

W. S. Phelps, Sangatuck, Harbor 34.
Chas. E. Tooker, Port Jefferson, Harbor 38.
Andrew Aronburn, Savannah, Harbor 36.
A. L. Fitts, Toledo, Harbor 43.
A. E. Gore, New York, Harbor 12.
J. W. Cann, Brooklyn, Harbor 11.
C. A. Benham, Cleveland, Harbor 42.
Wm. S. Durkee, Grand First Pilot.
G. B. Hussey, Providence, Harbor 13.
J. E. Reynolds, Port Huron, Harbor 46.
W. S. Van Keuren, Grand Captain.
Luther B. Dow, Grand Purser.
D. E. Stevens, Duluth, Harbor 44.
Benj. F. Perkins, Grand Captain's Clerk
C. B. Conine, Jersey City, Harbor 6.
J. G. Souer, West Bay City, Harbor 45.
E. T. Griffin, New London, Harbor 8.
T. G. Aldrich, Brooklyn, Harbor 5.
H. C. McCallum, Detroit, Harbor 47.
C. H. Brinkerhoff, New York, Harbor 1.
James Blodgett, Pensacola, Harbor 21.

Grand Officers and Captains of Principal Harbors, American Association of Masters and Pilots.

A neat invitation from the Globe Iron Works Co., Cleveland, announces that the steel barge Antrim, building for the American Transportation Co., of which H. G. Tener of Pittsburg is general manager, will be launched at 11 a. m., Saturday, May 8.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

The Review has excellent photographs of lake ships.

Admiral R. W. Meade.

Admiral R.W. Meade (retired), who died in Washington a few days ago, was one of the best-known officers of the United States navy. He saw hard service, before , during and after the civil war, and cruised

in all parts of the world on important naval and diplomatic missions. During the last administration he and the president had a serious disagreement, resulting from the admiral's criticism in an interview of the policy of the administration, and he retired.

Prices of Leading Ores.

We are able to give more completely than before the prices quoted for 1897 on old-range ores covered by the association agreement: Marquette range.—Angeline (hard), $3.46; Angeline Hematite, $2.82; Lake Bessemer (soft), $2.73; East End Bessemer (soft), $2.48; Salisbury Bessemer (soft), $2.50; Cleveland Bessemer (hard, crushed), $3.16; Sawmill (hard, crushed), $2.58; No. 1 Section 16 Bessemer (red specular), $3.42; No.2 Section 16 Bessemer, $2.90; New Shaft Section 16 Bessemer, $2.96—the last three being Lake Superior Iron Co. ores; Champion No. 1 (crushed hard ore), $2.90; Harvard Bessemer Hematite, $2.68; Bessemer Old Mine Hematite, $2.35; Regent (Queen), $2.52; Republic Special, $3.40; Republic Specular, $3.17. Goebic range.—Norrie, $2.65; Aurora, $2.80; Ashland, $2.66; Tilden, $2.56; Montreal, $2.77; East Vein Anvil, $2.26; Brotherton, $2.62; Sunday Lake, $2.85; Eureka, 2.26½; Atlantic, $2.50; Palms, $2.57; Cary Empire, $2.35. Menominee range.—Chapin, $2.40; Ludington, $3.11. Vermilion range.—Minnesota, $3.11; Chandler, $2.92½; Pioneer, $2.87.—Iron Trade Review.

In answer to the charge that the gate machinery of the new Poe lock at Sault Ste. Marie is entirely unsatisfactory, Col. Lydecker, who succeeded Gen. Poe in charge of the work, says that while the machinery has given some slight trouble, the reports have been greatly exaggerated. The machinery was designed by a competent mechanical engineer as peculiarly fitted to work the gates. It is of the most complicated description. Naturally the force that works it needs education on that score alone, as it is totally unlike anything ever before used. Besides this it is new, and like all machinery that has been little used is subject to disarrangement. Nevertheless the force has done well with it and the delays have been caused by the breaking of only minor parts not exactly adapted for their work. The delays, however, have been very short each time, as the parts to replace them were right at hand. Col. Lydecker adds that the machinery has not been given a fair trial, and that if, after a long trial, it is proved to be inadequate for the demand upon it, he will have it replaced. But he is entirely confident that it will ultimately give every satisfaction.

Around the Lakes.

Captain Fred Weimer has sold his schooner, the Thos. H. Howland, to the Northwestern Oil Co. of Milwaukee for $3,000.

After May 12, the flash in the fixed white light near the extreme north point of Milwaukee bay will occur every thirty seconds, instead of every forty-five seconds as heretofore.

Chicago's fire department will soon advertise for bids on another fire boat, which will be one of the largest in the country. An appropriation of $50,000 has been secured for the vessel.

The new shop at the plant of the Ship Owners' Dry Dock Co., Ceveland, where repairs are to be made to steel vessels, is 100 by 40 feet, and a store room, also new, is to be 30 by 40 feet.

The two whaleback tow barges, Nos. 201 and 202, which were brought to the lakes from the coast and lengthened during the winter by the American Steel Barge Co. at West Superior, were launched within nine minutes of each other on Saturday last.

The composite steamer Lewiston, which is owned by Capt. John Green of Buffalo, and which was lengthened at Chicago during the winter, has just moved a cargo of 102,000 bushels of corn from Chicago to Buffalo.

A Buffalo dispatch says that the Rochester & Pittsburg Coal & Iron Co. is preparing to ship about 75,000 tons of soft coal during the coming season. Soft coal shipments by lake will appear as a new feature of Buffalo commerce.

Mr. W. S. Canright, who was with the Northern Steamship Co. under the management of the Messers. Gordon, and who has of late been associated with Mr. John Gordon in the management of the Great Lakes line, is to return to the Goodrich Transportation Co. of Chicago, about May 15, as purchasing agent. With the exception of the past few years, Mr. Canright had been connected with the Goodrich company from boyhood.

Duluth's steamboat inspectors seem to have determined upon applying severe measures to masters charged with violating the steamboat laws. They have suspended for thirty days the licenses of Capt. David Wilson of the steamer Elfin-Mere and Capt. Charles Black of the steamer Simon Langell, who are charged with having raced through the canal entrance to the Duluth-Superior harbor, in an effort to secure first turn at a coal dock.

Hughes Bros. & Bangs, who have opened an office in Buffalo and are preparing for the big breakwater job which they will have under way at that point during the summer, say they will sub-contract no part of the work. Most of their material will come from Lockport and Windmill point on the Canadian shore. Stone from Lockport will be brought down the canal in boats specially fitted for the purpose. A dredge which the Osgood company is building for them at Albany, will be used to excavate mud from beneath 30 feet of water, so as to reach solid bottom for the timber crib section of the breakwater. About 30 feet of mud must be excavated from beneath the 30 feet of water, and the dredge must necessarily be large. It will have a clean-shell scoop that is expected to take up 10 cubic yards at a dip and remove 3,000 yards a day.

A communication from the Peerless Rubber Mfg. Co. of 16 Warren street, New York, says: "Discharged and ex-employes of this company are making false claims as to the founding of the company and the manufacture of its goods. This company was founded in 1872 by Charles Foster, Jr., and Henry S. Winans, who associated with themselves as superintendent Mr. John H. Deming, who has had entire charge of the manufacturing department. Mr. Deming has been with this company continuously since 1872, and is at present our general superintendent. He has had thirty-four years continuous experience in the manufacture of fine mechanical rubber goods. This long experience places Mr. Deming in the front rank of manufacturers. We believe him to be without a peer. Rainbow packing was suggested by a prominent merchant to C. H. Dale, then general sales agent, and with all other goods made by this company was introduced to the trade solely by Mr. Dale; and Mr. John H. Deming is the only man who has ever manufactured Rainbow packing, and is the only man who knows how. We would also say that Mr. Deming is the only superintendent this company has employed, or has had in its employ as superintendent, since it was founded in 1872."

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ¼ per cent. of the whole, but largely in American vessels.

In the general movement towards a reduction in freight handling charges, it would certainly seem that the elevator interests at Buffalo have not borne their share. The Lake Carrier's committee who have had this matter in hand are entitled to thanks for having secured anything in the way of a reduction from the Buffalo combination, but the fact remains that transfer charges at Buffalo as a whole are still largely in excess of what they ought to be, and if it were not for the great advantages of the lake route otherwise, these charges would certainly be the means of causing southern exporting ports to secure a much larger portion of the grain business than they have as yet obtained. It is expected that the completion of new elevators, which Chicago and other interests now have under way in Buffalo, will overcome, to a large extent, this disadvantge of exorbitant handling charges, but in the meantime let us consider the reduction made this spring in theshoveling charge. The new rate is $3.35 per 100 bushels, against $3.50 last season. This reduction of 15 cents is equal to about 4¼ per cent. In the charge for unloading ore, a reduction is made from 16 to 14 cents, which is equal to 12½ per cent. Thus in the charge for unloading ore, which is nearly all manual labor, we have a reduction of 12½ per cent., against 4½ per cent. in grain shoveling. There is no room in either case for any reduction in the labor cost, but the small portion of the charge for unloading ore that goes to the dock companies would seem to indicate that the profit in that line is not unreasonable, and yet they bear half of the 12½ per cent. reduction. Iron ore dock property does not now earn more than a fair profit, but such is not the case with the Buffalo organization. The new elevators must break up this combination. The interests of the lakes demand it. Grain must not be diverted to southern ports like Galveston and Newport News, on account of handling charges at Buffalo that could not possibly be maintained under any conditions excepting such as have governed the Buffalo elevating association for several years past. The government is improving harbors all along the Atlantic seaboard, and railway systems leading to these harbors, especially in the south, are taking business from the lakes. Take Galveston, for instance, where the depth of water is now 26 feet and where there will be 30 feet within a year. The government has made Galveston a perfectly safe harbor by a costly work. There are two jetties, one seven miles in length and the other five, and the distance between them clear to the open sea is about 7,000 feet. They are built of sandstone and granite in the most thorough and substantial way, and will stand for ages. The drift of business to this and other new harbors of its kind is shown by the fact that in 1896 the value of exports from Galveston harbor was 60 per cent. greater than for any year in its past history, despite the low average of prices of all kinds of products. The prediction is made that ere many years Galveston will be one of the greatest marts of commerce in the United States.

Dispatches from Washington would indicate that the new administration favors the establishment of a department of commerce along the lines that have been under consideration for some time past. It is said, in fact, that in his next message to congress President McKinley will make this a feature of his recommendations. The new department would include, by transfer fom the treasury department, such bureaus as the life-saving service, light-house board, marine hospital service, steamboat inspection and navigation bureaus, United States coast and geodetic survey and bureau of statistics. None of these logically have anything to do with the management of national finances. It would include also, by transfer from the department of state, the bureau of consular service and the bureau of statistics, the latter to be consolidated with the similar bureau from the treasury department. While the department of state has charge of diplomatic relations with foreign governments, it is claimed that the consular service should be entirely apart from politics and diplomacy.

Hot Corn—Causes that Create It.

The discovery in Buffalo of hot corn in the holds of several vessels this spring has led to a discussion of causes that contribute to create this condition in the grain. Corn is probably the most difficult of cargoes to handle without loss to the owner of it, owing to its combustible nature. It may arrive in the elevators at Chicago or Duluth apparently in the best of condition. It is hoisted into the bins and then left, inspected to a good grade. The weather may turn wet for a day, or several days, and the corn be spouted into a vessel's hold afterward. The inspector walks from spout to spout, snatches a handful every minute or two, and presently discovers that the corn from a particular spout is hot. He immediately orders that spout stopped, and will so order the rest if he finds the same complaint to make. The damp weather has done the business. But the weather may be dry and the corn still found to be hot. Then the conclusion is reached, through previous experiment, that the very weight of the top corn has heated the corn at the bottom.

Corn is liable to heating at any time or any place. The best storage place of all for it is the hold of a vessel, particularly one of steel. The cold water in which rests the hull creates a cool atmosphere in the hold, and as corn is always at its best in cool weather or a cool place, the vessel is always sought for it when winter storage is needed. Again, the hold is not as deep as an elevator bin, hence there is less weight on the bottom cargo. The loss, in all cases, is sustained by the owner of the cargo. It may be the consignee, who has paid for the corn before it has been loaded into the vessel for him, or it may be the consignor, who has not yet received his pay for it, and who is the owner until the cargo has arrived at destination and he has been paid. The elevator or the vessel cannot be held for the loss if it is proven that the corn has heated through natural causes. Corn that is damaged through a leaking hatchway or an open seacock is paid for by the vessel. This is a common occurence with vessels that hold it in the winter for storage. The damaged grain extends directly downward from the leak, and the dampness does not spread about enough to damage any but a certain amount directly beneath the hatch or the cock. Corn that is not too far gone can be dried in a kiln and converted back to almost its old grade. The buyer of corn will do well, before paying for it, to be sure that it has been seasoned before it is shipped. The drier the corn the better his chances of getting it in a pure state.

What is heat in corn is weevil in wheat. The weevil is a minute maggot that is bred by dampness in wheat and that multiplies at the rate of millions a day, so that an infinitesimal part of a cargo affected by it will contribute disaster to all the rest, so rapidly does the infection spread. There is no use for weeviled wheat. Oats and barley, from the point of view of damage, are the best cargoes to carry, as they will not damage unless in a leaking vessel But they are hard to get, as there is comparatively little of either consumed, hence so few charters to hold them through the winter.—Exchange.

Forcible Terms on the Business Situation.

A vessel owner in one of the St. Clair river towns sends the following interesting epistle on the subject of lake freights to a Cleveland vessel broker:

"When I sat down, I was of the opinion that I had something to write about, but a 'gust' or ghost of prosperity struck me in the cranium and removed all solid thought. It may have been the effects of the weather, which is emblematic of the business situation—dark, cold, gloomy, drizzling, foreboding, harrowing, prostrating, demoralizing, destructive, paralyzing, and—well, if there is anything else more expressive, that's what's the matter with the weather and more especially with 'prosperity.' Returning from my wanderings, I may say that I am having quite a time holding down the fellows who want to go out with the ships. They want bread and butter and we want it too, but we don't want to encounter debts in order to get it. I see nothing in the newspaper reports that tends to allay our troubled spirits, and I presume you are not burthened with information of the kind that gives hope of fabulous dividends. If you were, I would probably have heard from you long ago. But there is an aching void to be filled, and it occurred to us that probably you might be able to find something in the way of Portage coal and Marquette ore, or Gladstone coal and Escanaba ore."

Shallow Places in the Detroit River.

A correspondent at Amherstburg sends the Review the following regarding the condition of channels in the vicinity of Ballard's reef and Amherstburg, Detroit river:

"Water guages show about 17 feet 6 inches as present depth of water at Ballard's reef. This is about the same as given by guage readings for the past ten days. For this depth of water, the ledge of rock marked by a black spar buoy (No. 5½) should be avoided. To do this the range at the upper end of Grosse Isle should be just opened to the westward, giving the black spar (just north of the gas buoys) a berth of at least 75 feet. Just above Lime-Kiln crossing, along the Ballard's reef course, the Duff & Gatfield range should be kept open to the westward, as along this course, in front of the Texas dock, a ridge of boulders has been found. The least depth of water over these boulders is 17 feet. They are now being removed. The entire stretch of the channel from Ballard's reef to the south end of Bois Blanc island has been swept this spring and several boulders located, just below a depth of 17.5 feet. These boulders will be removed as soon as possible, the work having commenced a week ago. Should vessels meet with obstructions in the channel at any time, reports should be made, in order that the men working under the direction of Col. Lydecker, United States engineer, may take steps to have such obstructions removed at once."

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, May 1, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	8,084,000	7,277,000
Duluth	6,219,000	52,000
Milwaukee	229,000	3,000
Detroit	124,000	28,000
Toledo	867,000	1,020,000
Buffalo	741,000	223,000
	16,264,000	8,603,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 1,738 bushels of wheat and 1,134,000 bushels of corn. Grain afloat at Chicago May 1—Corn 80,000 bushels; at Buffalo, wheat 50,000 bushels, corn 113,000 bushels, oats 36,000 bushels.

A vest pocket pamphlet just issued by the Marine Review contains appointments of captains and engineers for 172 fleets of vessels owned on the lakes. It is practically a complete list of vessels, owners, captains and engineers on the lakes, corrected to date and put in the most concise form that it is possible to arrange the several thousand names contained in such a collection. It is neatly bound and durable. Mailed to any address on receipt of $1.

The Review has excellent photographs of lake ships.

A Tribute to the Late Capt. John S. Richards.

Capt. Charles Gale of Sombra, Ont., is among the few men now alive who were sailing the lakes when steam vessels were unheard of in freight service. He is very old but still shows a great interest in lake matters. Out of respect for Capt. Gale and the late Capt. John S. Richards, of whom he writes, the following communication is printed:

Editor Marine Review:—The Review had a perfect likeness of my worthy deceased friend, Capt. John S. Richards of Erie. He had been a loving friend for over fifty years. Once while a passenger on the Queen City, in days now long gone by, I had paid my fare, but he returned it to me. It was the custom in those days for one vessel master to pass another, but Capt. Richards had an especially pleasing manner in extending this courtesy. He was very courteous to passengers and never seemed to tire of answering questions for them. He towed me out of Buffalo many times in the days when there were no tugs, and always without charge. When bound to Buffalo, I would drop him a letter for a load of coal and it was always ready for me, and without cost of brokerage. Once while loading the schooner Frank Perew at his dock in Erie, he requested me to move to make room for some canal boats, and in the shifting of vessels one of my men, John Shaw, fell overboard and was fatally injured. The captain helped me to carry him to the cabin and remained with him half the night. We were in port five days but could find no place ashore for the injured sailor. He died on the fifth day, and as he was penniless, we were called upon to give h m a proper burial. He had sent his money home regularly to a widowed mother, and on his death-bed had kissed the hand of Capt. Richards, praying that God would be good to the mother whom he was leaving. The poor sailor's regard for his mother had appealed to the kind heart of Capt. Richards, and he volunteered the work of giving the man a fitting burial. After arrangements had been made with an undertaker, late on Saturday night, the wind was fair and I was forced to leave, but the commander of the U. S. S. Michigan, which was in port, had promised to attend the funeral with his officers and crew, and I knew that the last rites over the poor sailor would be properly attended to anyhow by Capt. Richards. I learned afterwards that the remains had been taken to a church and that the funeral would be fitting to a naval officer.

This incident alone in my acquaintance with Capt. Richards would be enough to convince me of the higher qualities of manhood that were generally recognized in him. I grieve while he is at peace. He sleeps the sleep that knows no waking. I wish him back for his family, to whom he was dear, and for the reason also that the world has need of such good, true and useful men. He can not come to us, but in a little while we shall join him when our troubles will also be over forever. He was a loving husband, kind father and a true and generous friend. His was indeed a life of love. He lived not for himself, but to promote the happiness of others. Such was his religion. Justice was his motto, truth his aim.

"Farewell, dear friend, sleep on, sleep ever,
I would not have you wake to pain and sorrow, no never."

"Cover him over, yes, cover him over,
Husband and father, true friend and brother;
Crown in your heart this friend of ours,
And cover him over with beautiful flowers."

I am filled with grief for the death of the captian. I have been feeble of late and it makes me think that my turn will come next.

Sombra, Ont., May 3, 1897. Charles Gale.

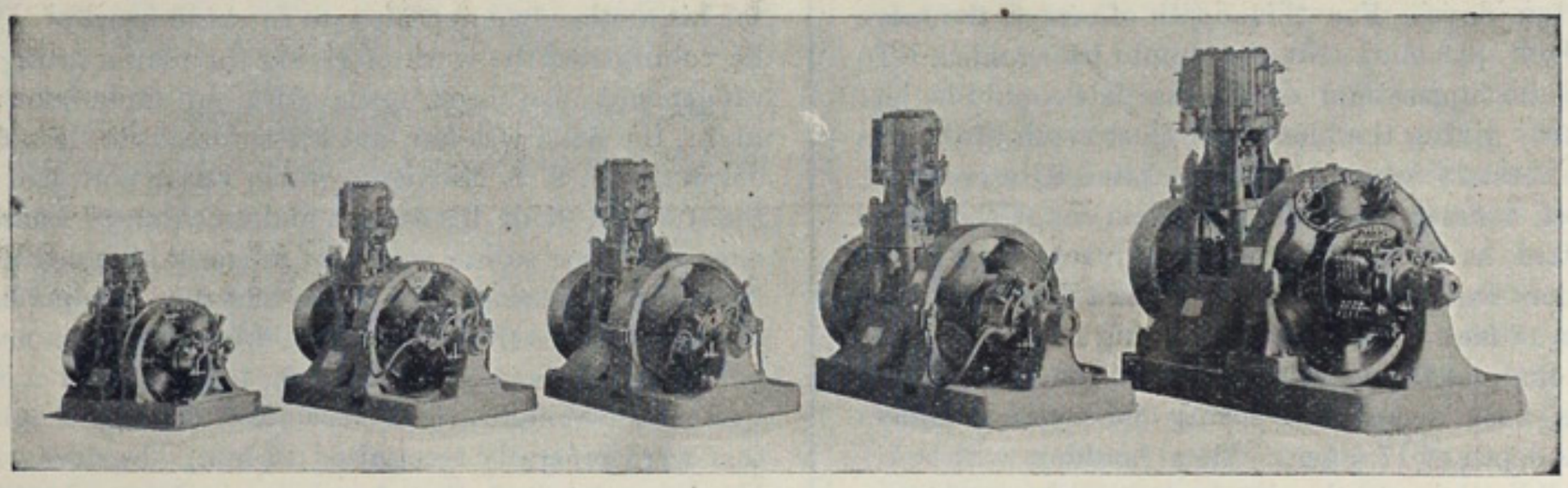
Princess Anne is the name of a passenger steamer launched at the ship yard of the Delaware River Iron Works, Chester, Pa., a few days ago, for the Old Dominion Steamship Co., which has for a great number of years maintained an excellent steamboat passenger service between Richmond, Norfolk and New York. The new vessel, which will go into commission about August 15, will be the finest ship in the company's service. She is 315 feet long, 42 feet beam and 27 feet depth of hold. Her tonnage will be about 3,000 and she will be fitted with triple expansion engines that are expected to develop about 3,400 horse power, giving her a speed of 17 knots. Cylinders of the engines are 27¼, 44¼, and 73 inches diameter and the stroke is 54 inches. Four boilers are each 14 feet 3 inches diameter by 12 feet length. In addition to a large freight capacity, accommodations will be provided for about 125 first class and 25 second class passengers.

Small Electric Plants for Ships.

The demand for small direct coupled engines and generators for marine plants meeting the necessary requirements of compactness, light weight, simplicity of construction, freedom from vibration and noise at high speed, and perfect regulation as well as durability and low cost, is met by the direct coupled generating sets manufactured by the General Electric Co. of Schenectady. These sets are built in sizes varying from 2½ K. W. to 25 K. W. and the fact that both engines and generators are manufactured by one concern is an assurance that fit and alignment are perfect, the finish uniform and the test thorough. The engine is simple. It has but one valve driven direct from the eccentric pin of the governor. The set is compact. The engine having a short stroke and the armatures being specially wound, both height and length of the sets are reduced to a minimum. The engine bed lengthened carries the generator, and although the appearance is somewhat massive, the bed is so carefully cored out that without sacrifice of stability the weight has been brought down to about one pound to 3½ watts.

Special attention has been given to the engine parts, to the end that the machine may run with perfect smoothness and regularity. The bearings are self aligning and self-oiling. The coupling between the armature shaft and engine crank is a split sleeve, which allows of easy removal of the armature. The governor is compact with but few moving parts, which can give practically no trouble or wear out. The 4 K. W., 8 K. W. and 20 K. W. sets have double cylinder engines; the 2½ K. W., 7 K. W., 10 K. W., 15 K. W. and 25 K. W. sets have single cylinder engines.

All of the generators are four-pole 110-volt machines, with the exception of the 25 K. W. generator, which has six poles and a full load voltage of 125 volts. The greatest floor space occupied is 80 by 47 inches by 66 inches high. The generators combine all the well known features of the General Electric machines, and the rating given to each has been calculated on a most conservative basis. The illustration shows a full line of single cylinder sets—2½ K. W., 7 K. W., 10 K. W., 15 K. W. and 25 K. W. That the single cylinder engines are economical is exemplified by the fact that they show as low as 28 pounds of water per I. H. P. per hour non-condensing, and 23.5 pounds per I. H. P. per hour condensing, using steam at an initial pressure of 80 pounds, just as it comes from the boiler, without superheating or making any allowance for entrainment. These results have been obtained by a series of tests, in which the water was accurately measured. Sets below 10 K. W. capacity are, of course, somewhat less efficient, but they will compare favorably with engines of other makes, representing the best practice.



The 1897 directory of the Ship Masters' Association is the handsomest book yet published by the captains. In addition to the names and addresses of members, seventy-eight pages are given up to a list of lake vessels with dimensions, tonnage, etc., and names and addresses of owners. General information valuable to captains is given in forty-five pages. The book is covered in red cloth and stamped in gold. It was published under the direction of the grand financial secretary of the association, W. A. Collier of Cleveland.

A new light-house on the south point of Put-in Bay island is nearing completion, and it is expected that the light will be in operation in a few weeks.

Capt. M. J. McAlpin, one of the old-time navigators and father of Capt. Hugh McAlpin, died at his home in Detroit, a few days ago.

American Pumps in Foreign Ships.

One large manufacturing concern in this country, the house of Henry R. Worthington, New York, seems to be getting its share of orders for pump equipments on foreign naval vessels. A partial list of foreign naval vessels that are equipped throughout with Worthington pumps includes in the British navy nine battleships of the largest class, a coast defense iron clad, two first class cruisers, three third-class cruisers, eight first-class torpedo boats, ten second-class torpedo boats, fourteen torpedo boat chasers and two first-class gunboats, as well as the queen's yacht Victoria & Albert. Vessels in the British government service in Africa and India and smaller craft connected with the war office at Cairo, as well as three first-class torpedo boats in the Indian marine, are also fitted with Worthington pumps. Vessels of other navies fitted with these pumps are: Russia, ten, including one battleship and two barbette ships of large dimensions; Germany, twelve, also including some of the largest ironclads and cruisers; Danish navy, two torpedo boats; Brazil, three torpedo boats; Spain, one first-class cruiser and two torpedo boats; Austria, four cruisers, two torpedo boats and sundry small craft; Chilian navy, six first-class torpedo boats; Argentine navy, on cruiser and four first-class torpedo boat destroyers; Japanese navy, two cruisers; Portugeese navy, vessels for service in Africa.

A novel launch took place recently at Morris Heights, New York, where the consolidated firms of Chas. L. Seabury & Co. and the Gas Engine & Power Co. have a large plant for the construction of steel and wooden yachts, naphtha launches and other pleasure craft. The steel steam yacht Hiawatha was launched about 10 p. m. in the presence of a large company of friends of the builders and owners. The ship yard and the yacht were beautifully illuminated with electric lights, Japanese lanterns, etc. This vessel is 170 feet over all, 138 feet on the water line, 21 feet beam and 8 feet draft. She has a Seabury water tube boiler and triple expansion engines developing about 1,000 horse power. Charles Fleischmann, the owner, is a resident of Cincinnati, but is a member of the New York, Atlantic and other eastern yacht clubs. The New York firm built a yacht for him last year, which was also named Hiawatha, but she was not large enough for his requirements, and he determined to go back to the same builders and obtain just what the experience of last summer's cruising had shown him that he needed.

"Perfection in Anchors" is the title of a neat little pamphlet that has just been issued by the Bald Anchor Co. of Chester, Pa., and which contains a collection of illustrations and valuable information of the subject of anchors of all kinds. The success of this company's stockless anchor has resulted in their making shipments by the car load to the lakes, and it would therefore seem that anything they have to say about anchors should prove interesting to both ship owners and ship builders.

"Lake freights: To Buffalo—Propeller Forest Queen, corn and barley at 6 cents; bark Chenango, corn at 4 cents. To Oswego Schooner Minnie Williams, wheat from Milwaukee at 10 cents." The foregoing is not a quotation representing present conditions. It is an extract from a photographic copy of the first issue of the Daily Trade Bulletin of Chicago, which was printed Wednesday, May 1, 1867. Freights of this kind are only a memory now.

Several hundred photograph negatives of lake ships are held in stock by the Marine Review. Prints can be made on short order.

During May the Nickel Plate road will inaugurate an improved passenger train schedule of three solid through trains daily. In addition to the through vestibuled sleeping car service between Chicago, Buffalo, New York and Boston, via the West Shore and Fitchburg railroads, a daily New York sleeper will be placed in service via the D. L. & W. R. R. 26-Apl-30.

UNITED STATES ENGINEER OFFICE, Telephone Building, Detroit, Mich., April 17, 1897. Sealed proposals for Dredging Black River, at Port Huron, Mich.; Bar at mouth of Black River, Mich.; Belle River, at Marine City, Mich.; and Clinton River, Mich., will be received here until 12 o'clock noon (Standard time) May 7, 1897, and then publicly opened. Apply here for information. G. J. LYDECKER, Lt. Col., Engrs. May 1

Chas. E. & W. F. Peck,

58 William St. NEW YORK CITY.

812 Royal Insurance Building, CHICAGO, ILL.

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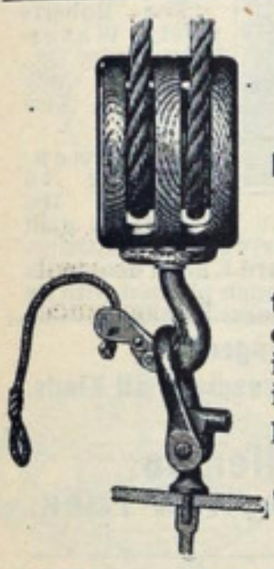

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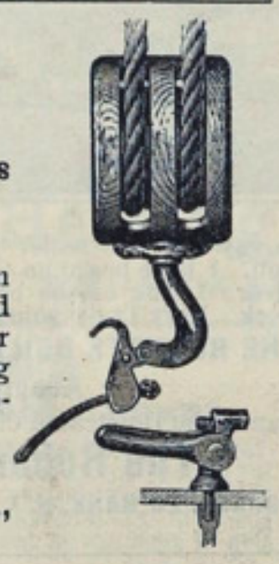

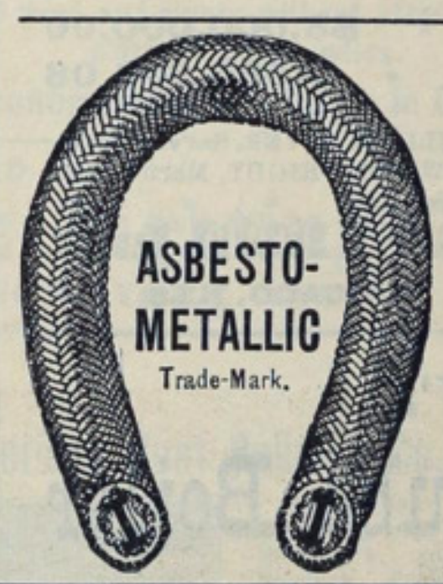

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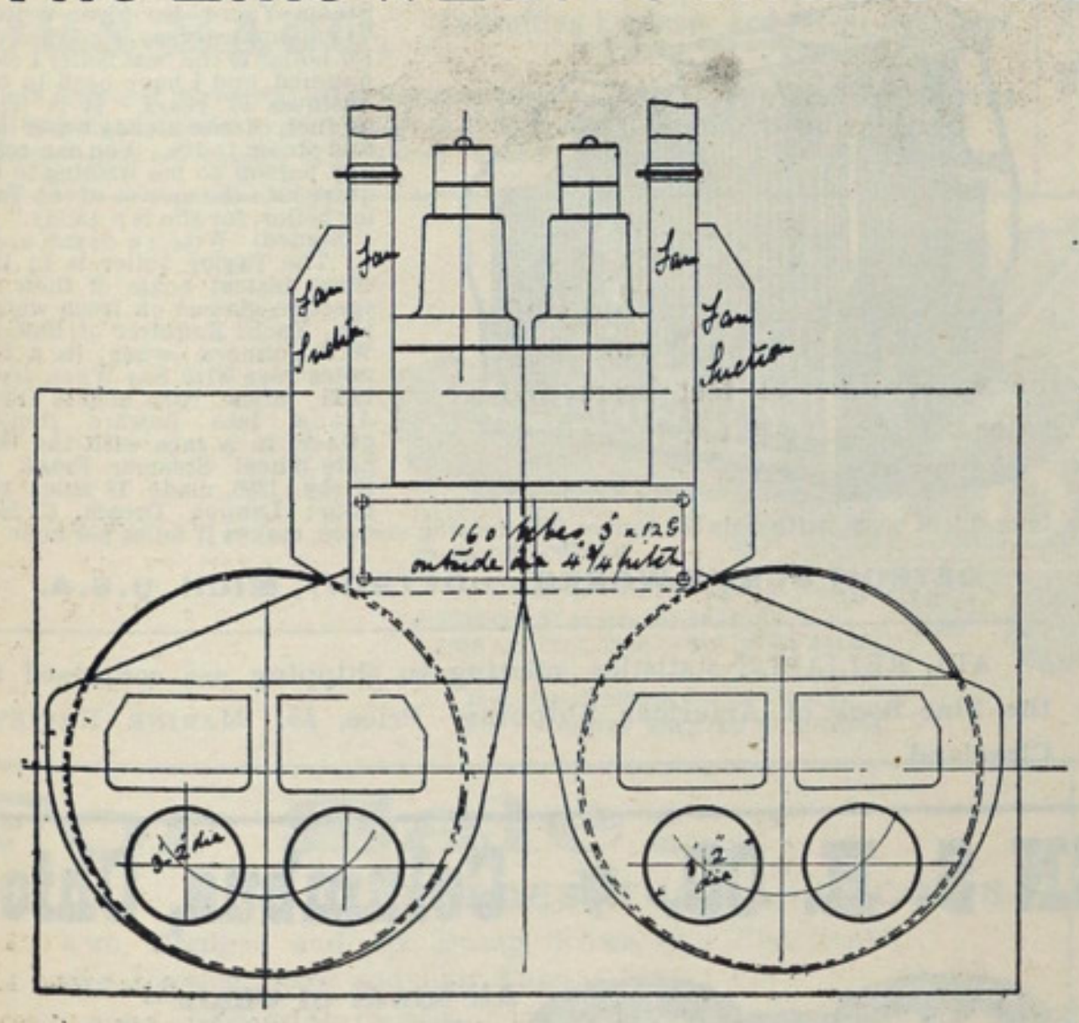

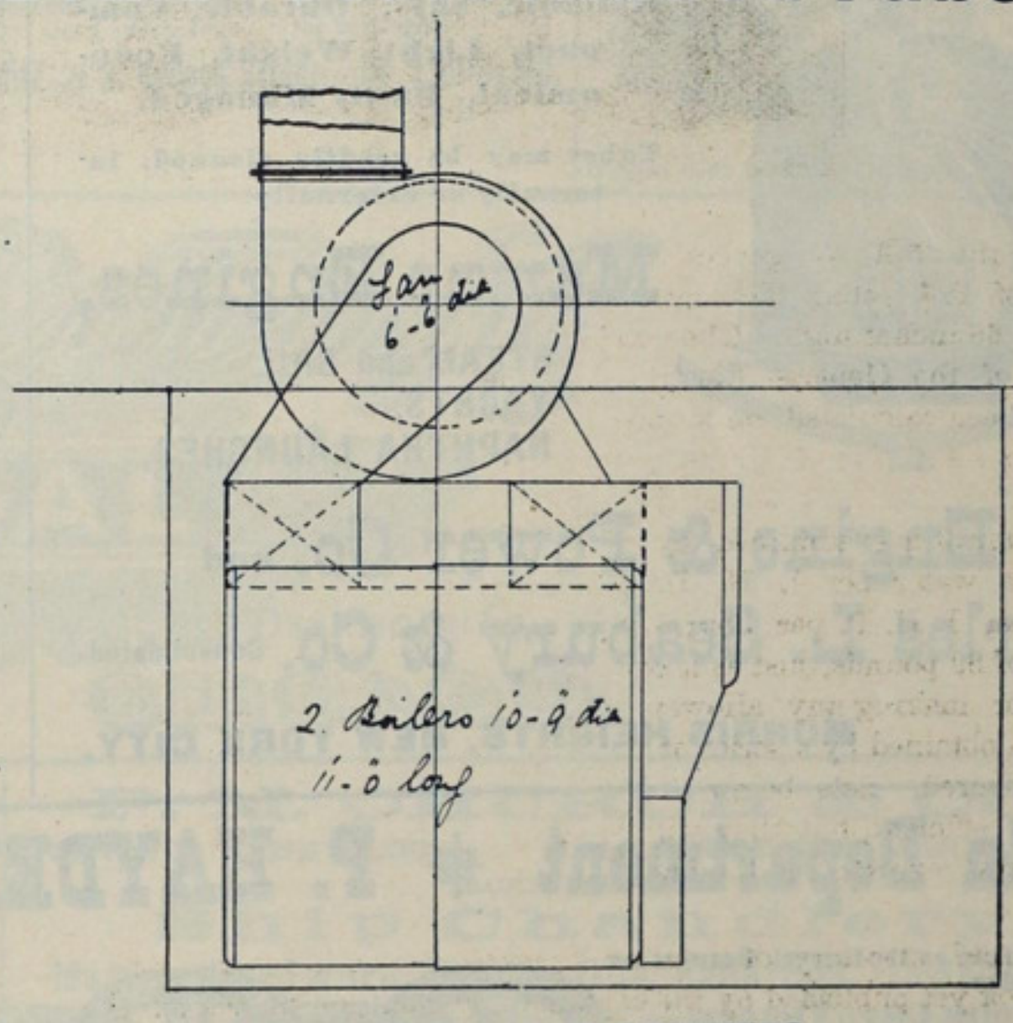

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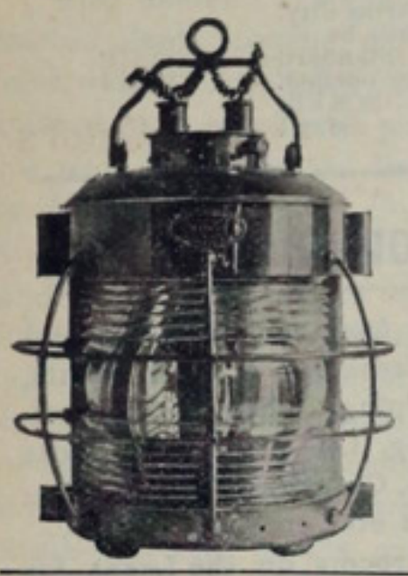

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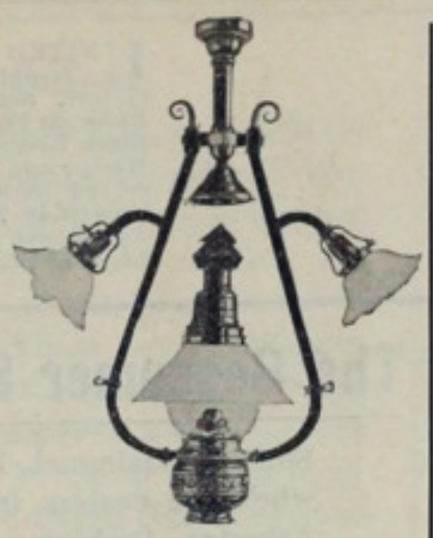

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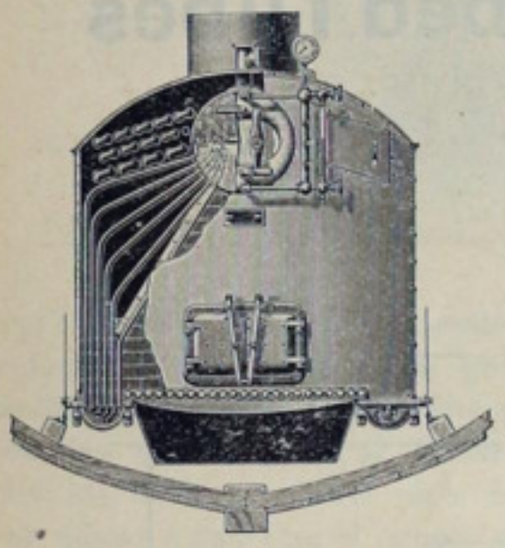

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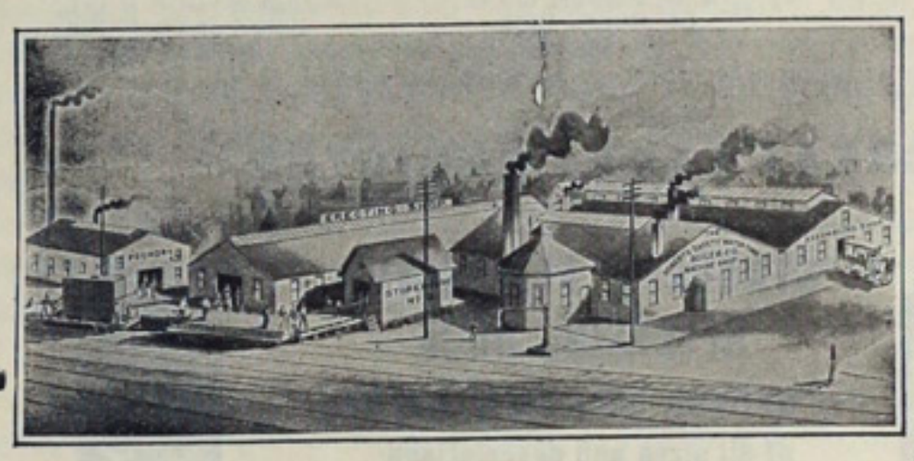

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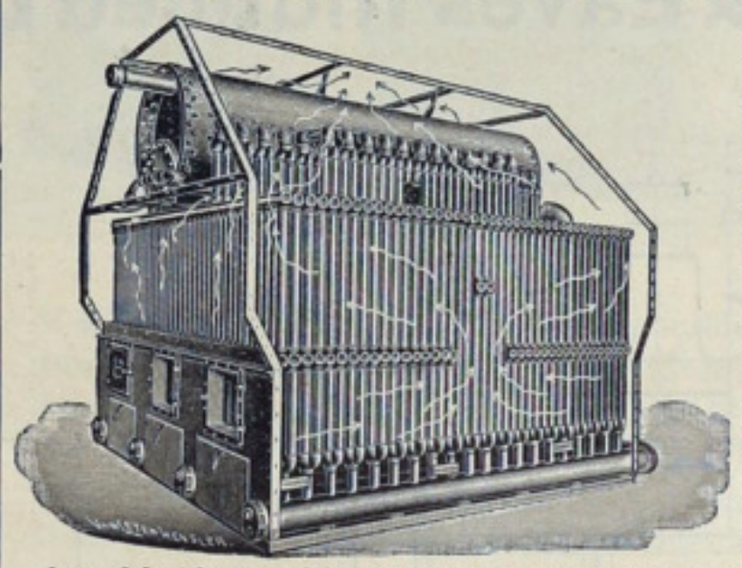

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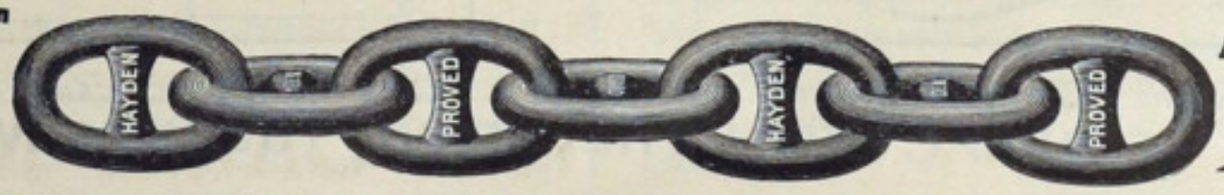

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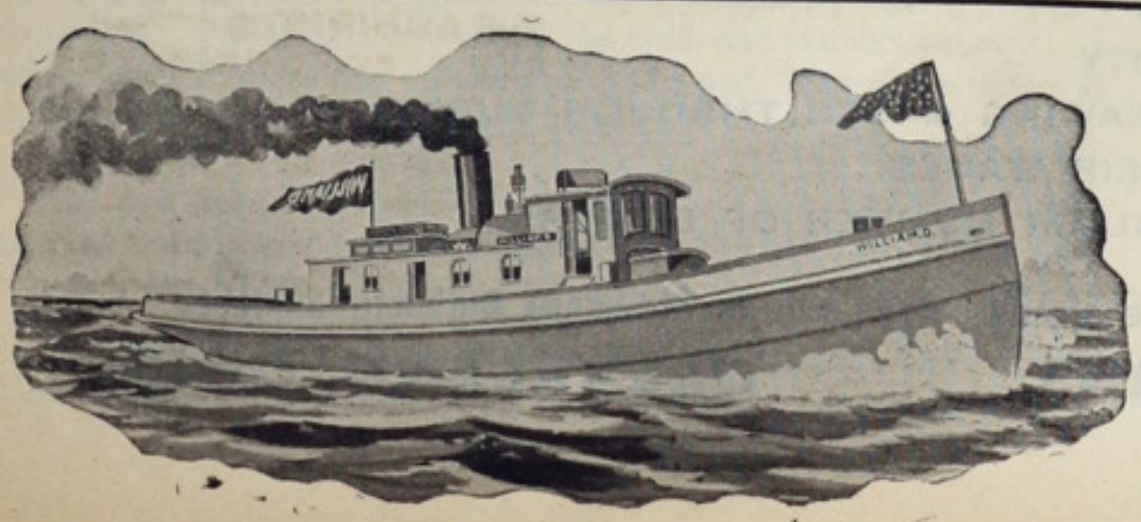

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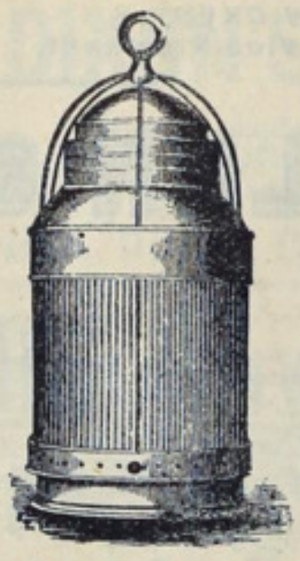

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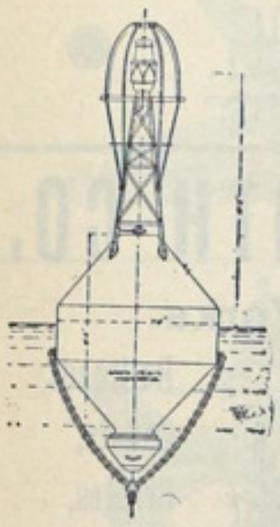

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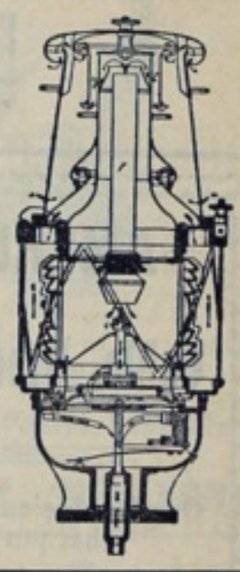

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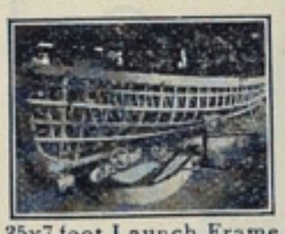

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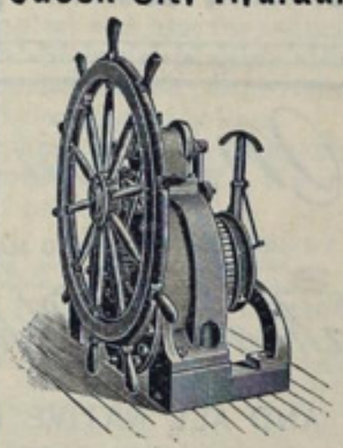

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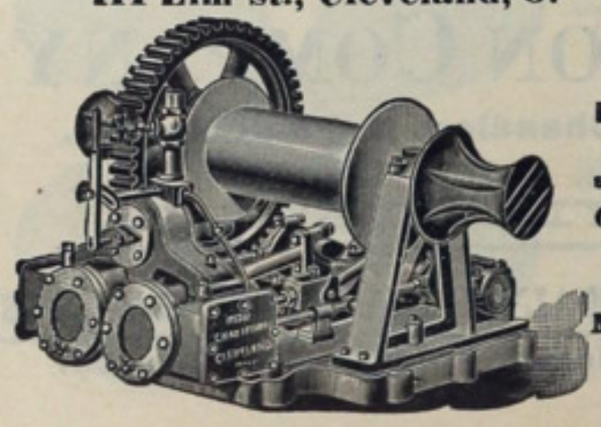

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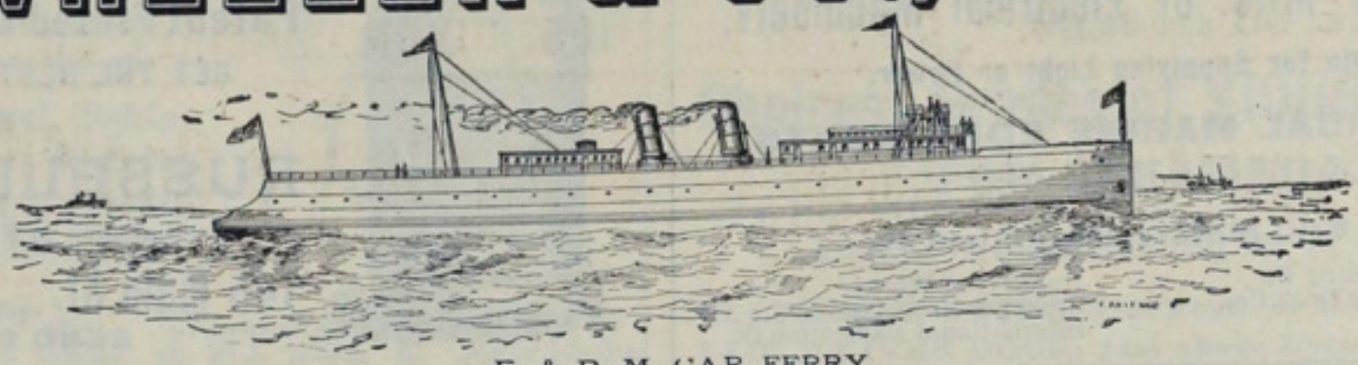

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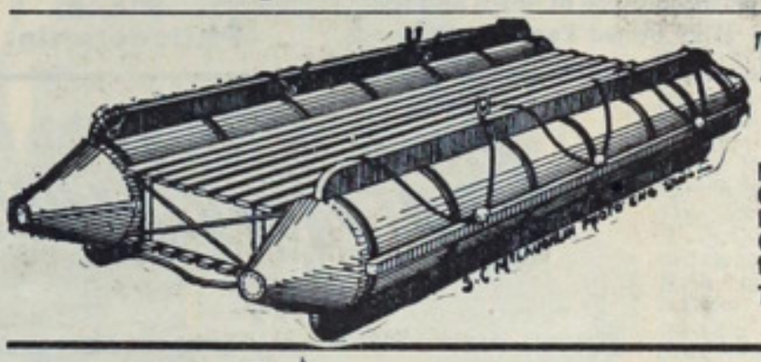

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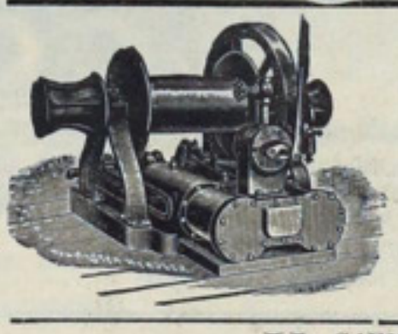

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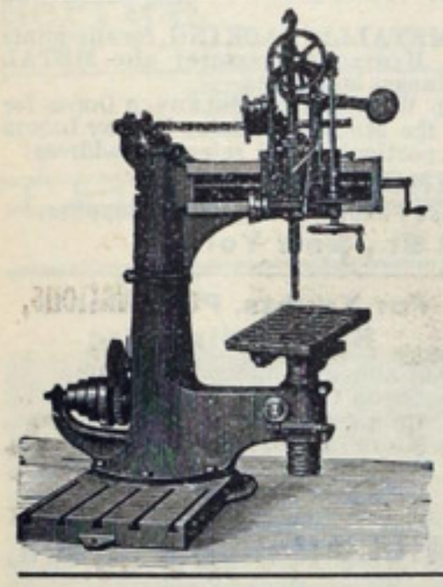

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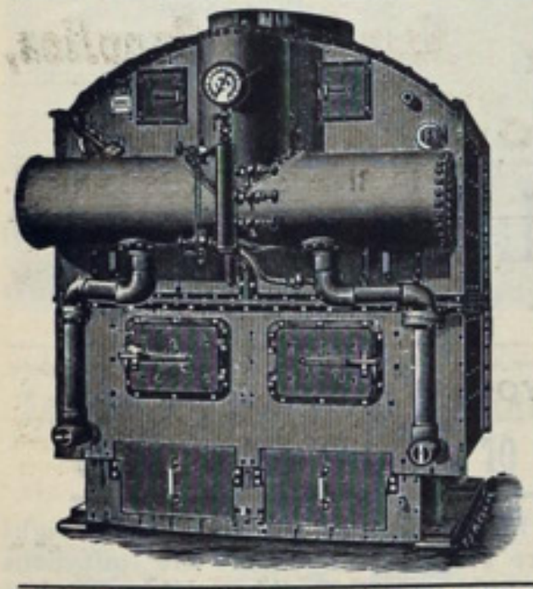

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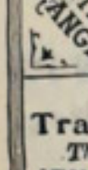

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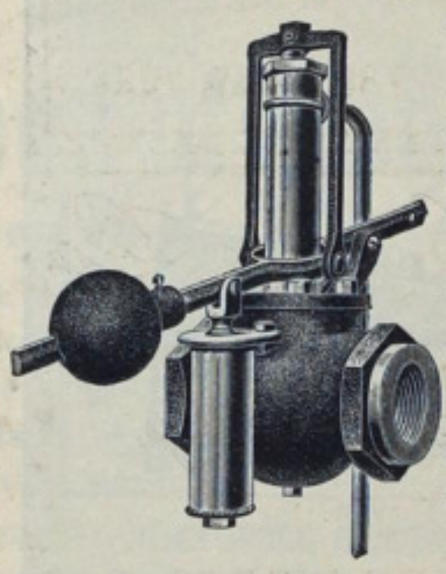

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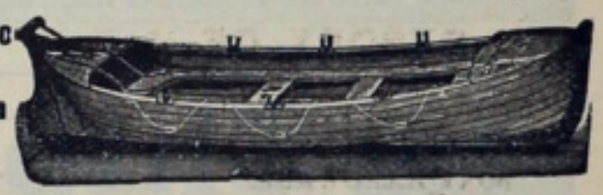

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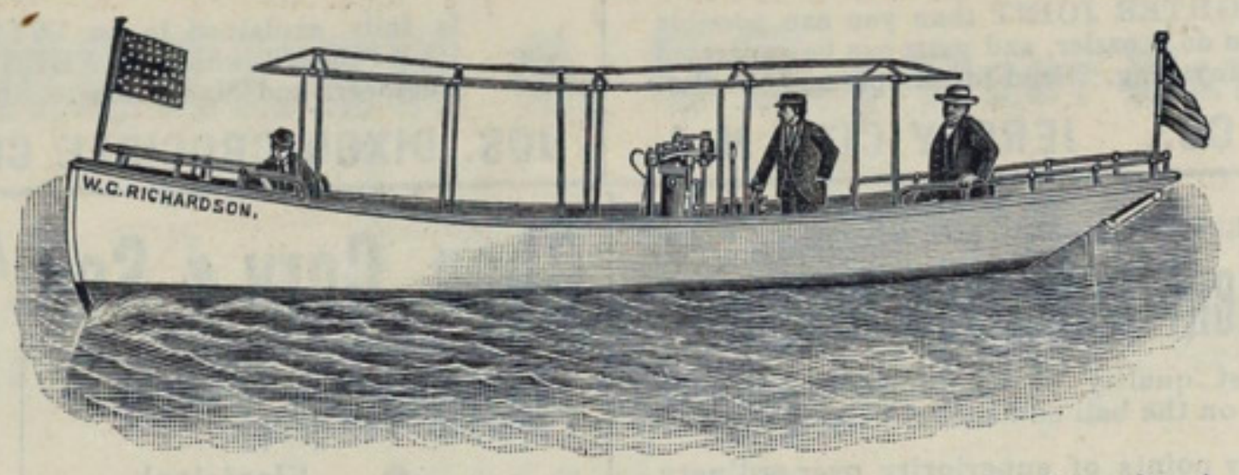

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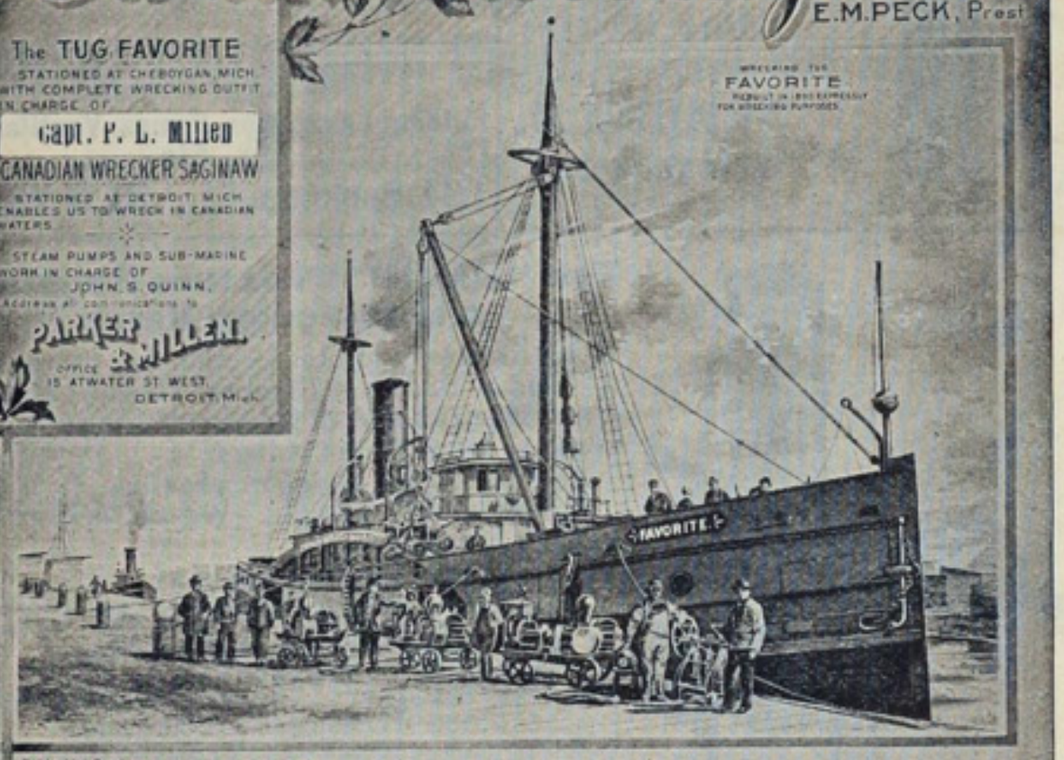

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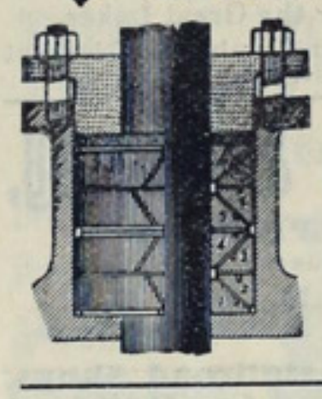

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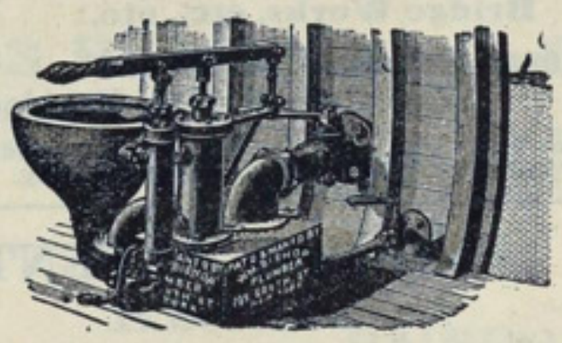

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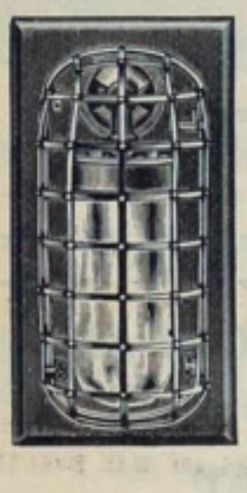

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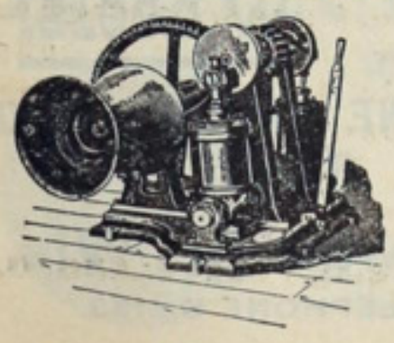

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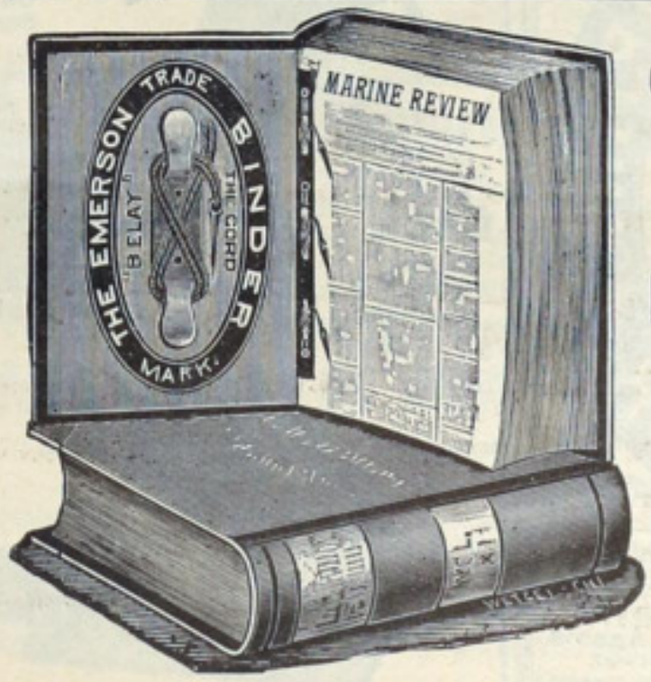

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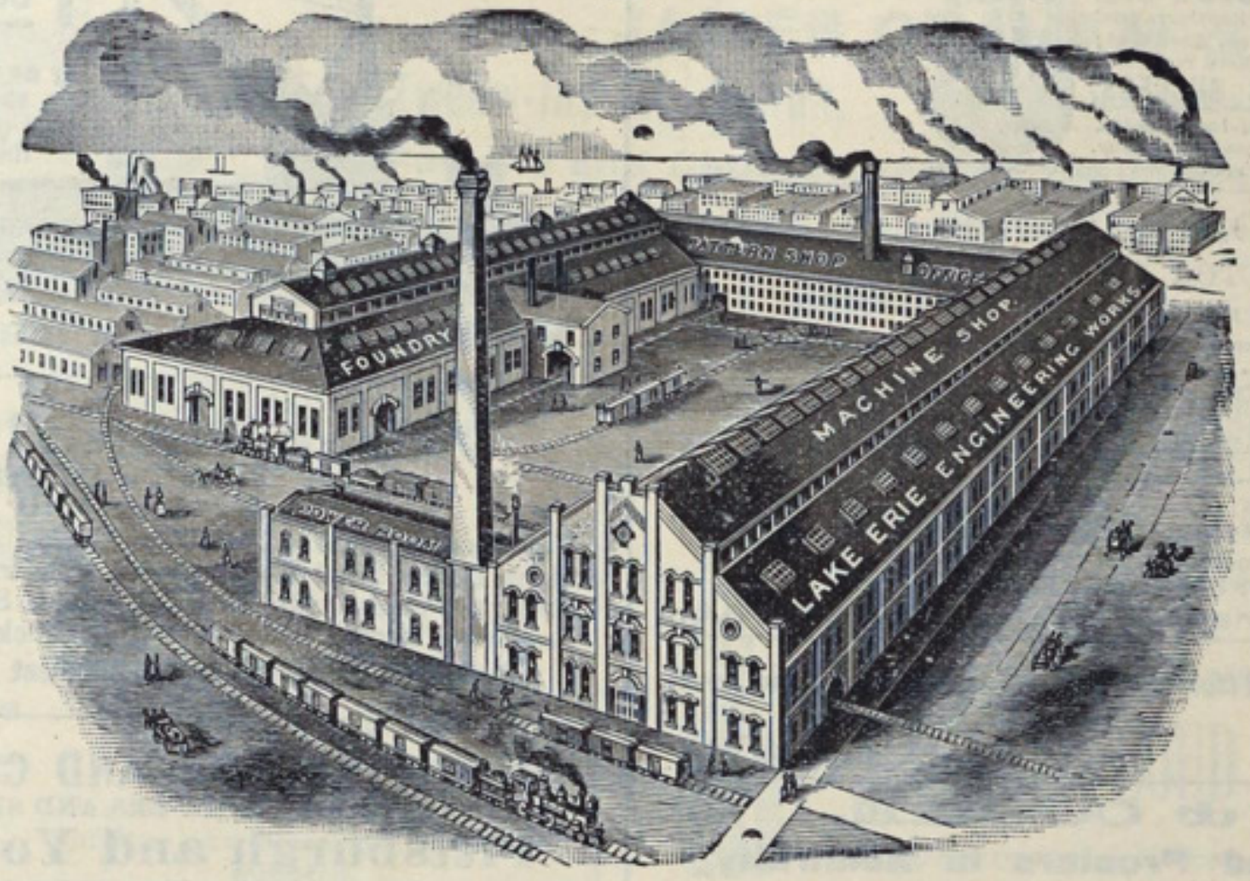

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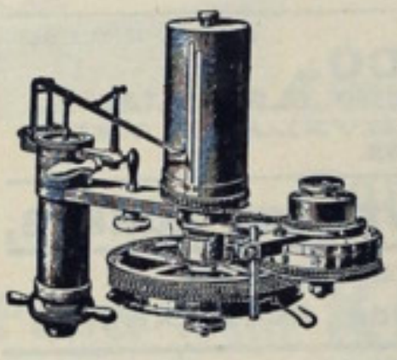

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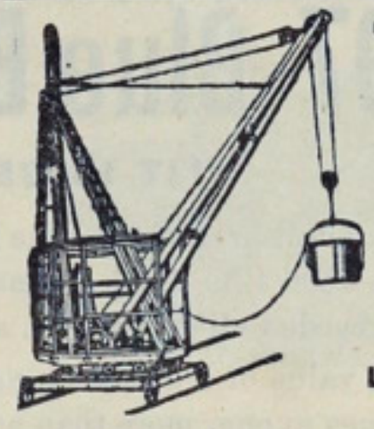

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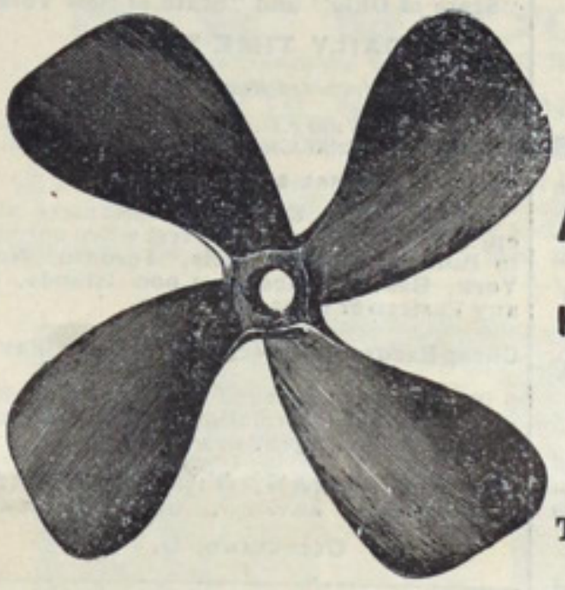

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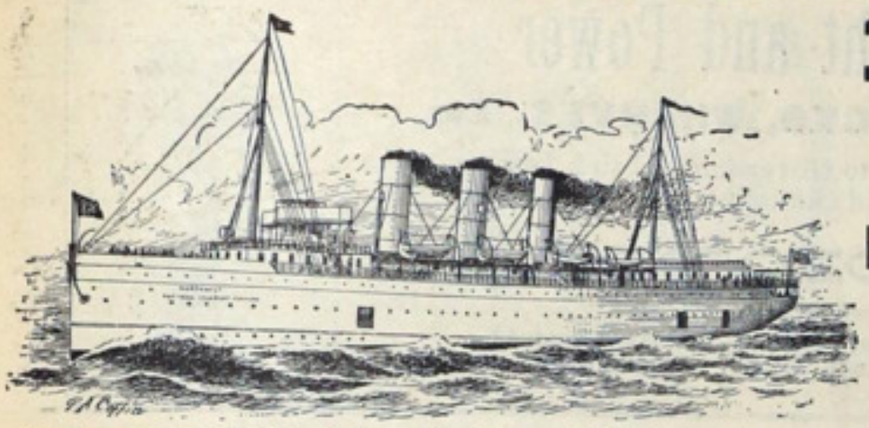

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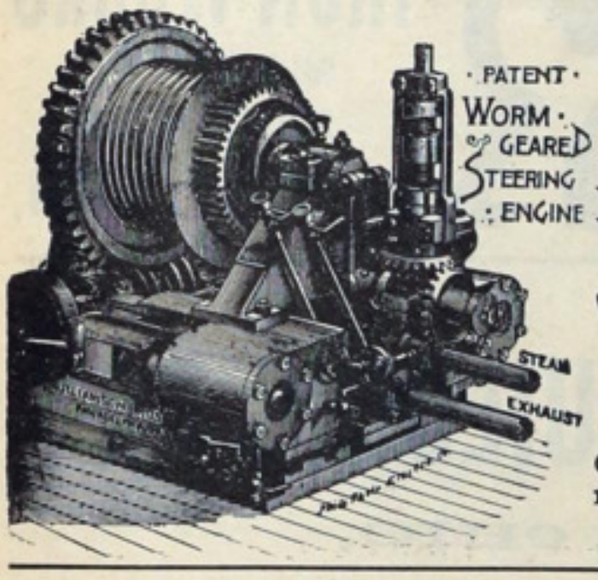

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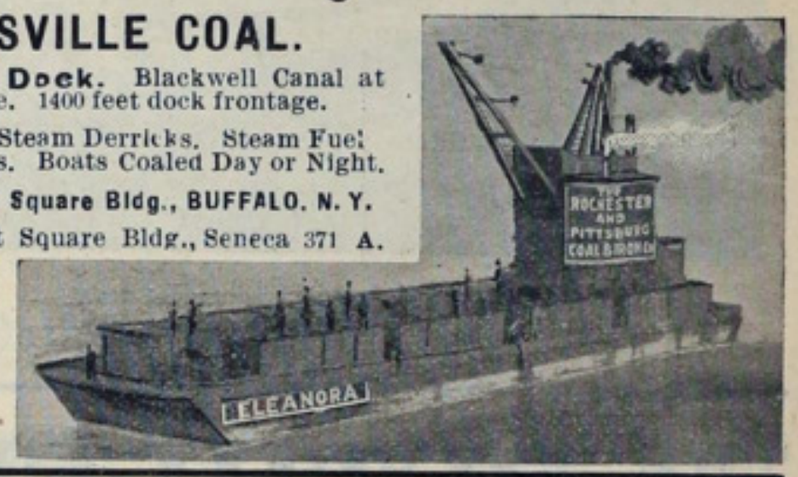

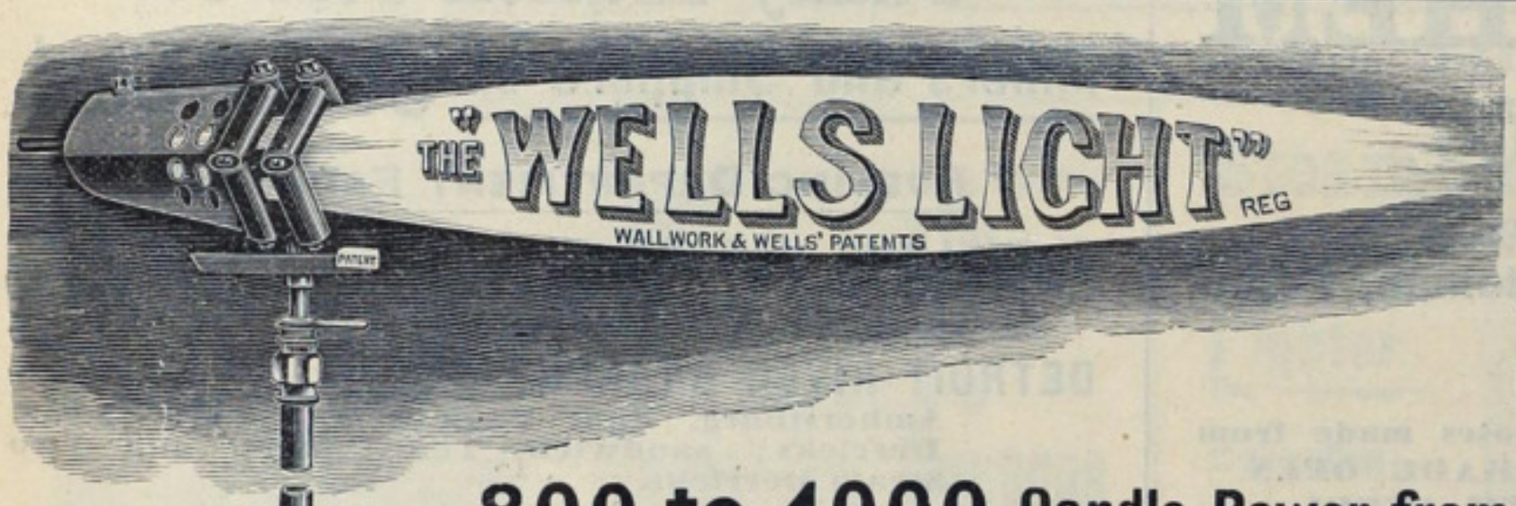

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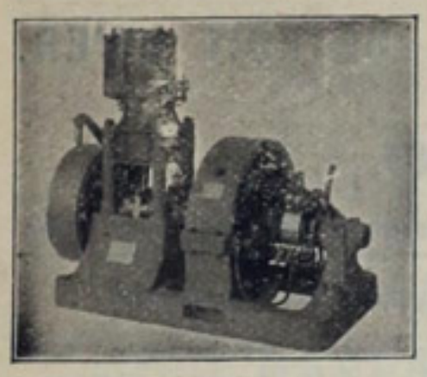

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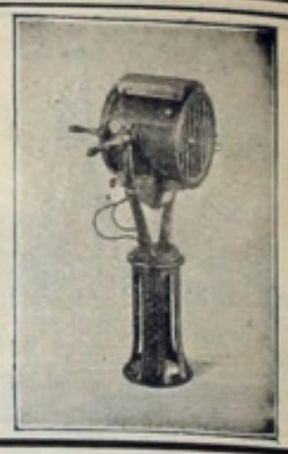

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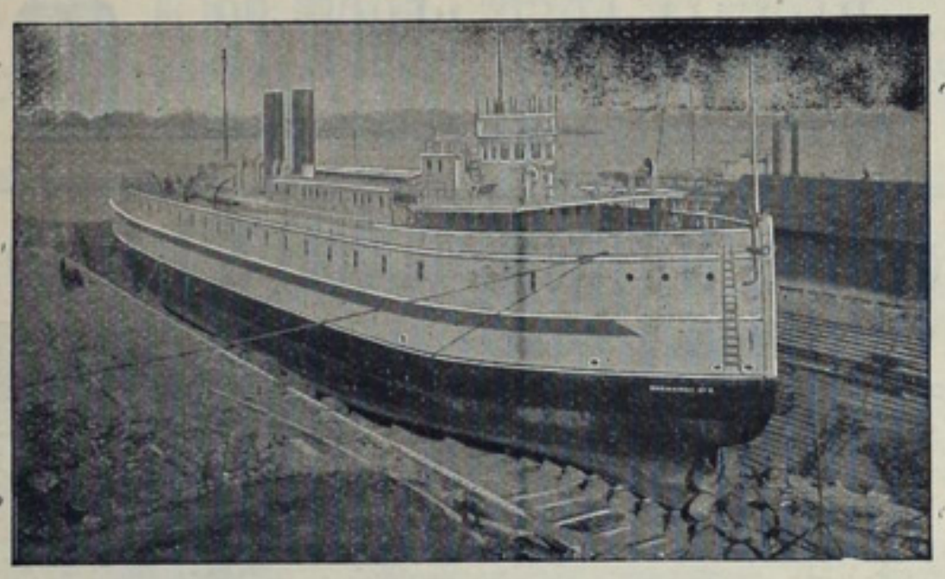

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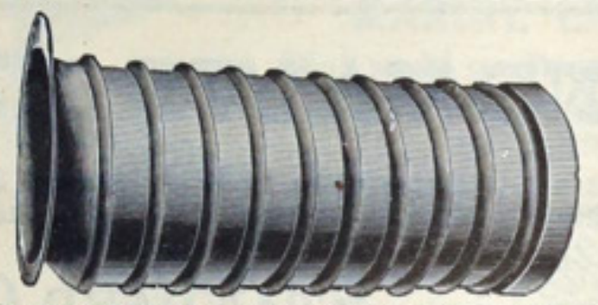

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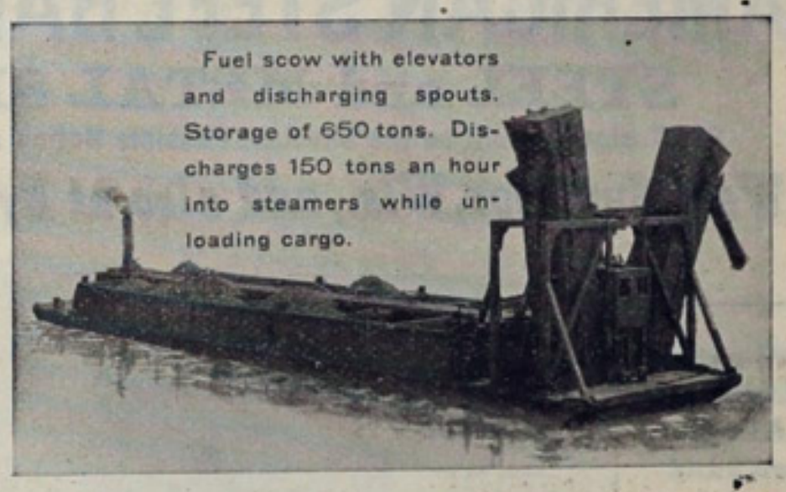

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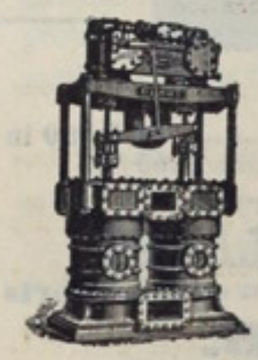

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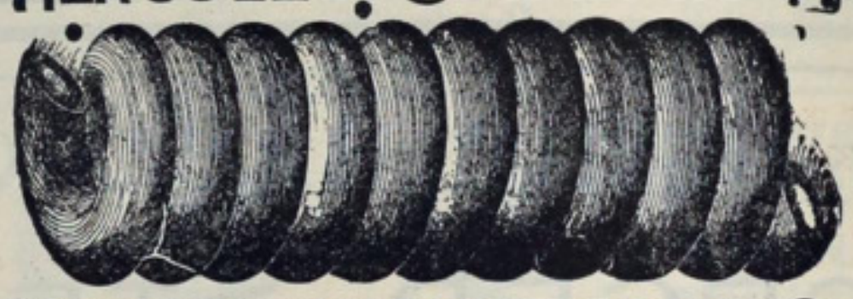

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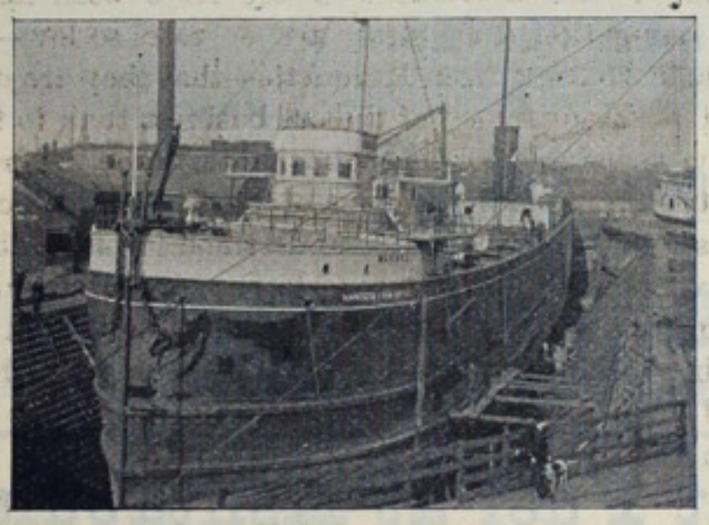

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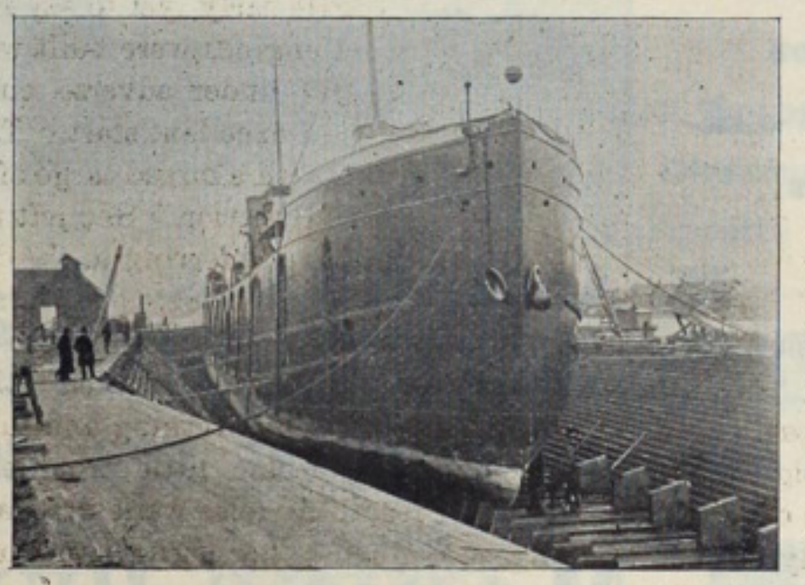

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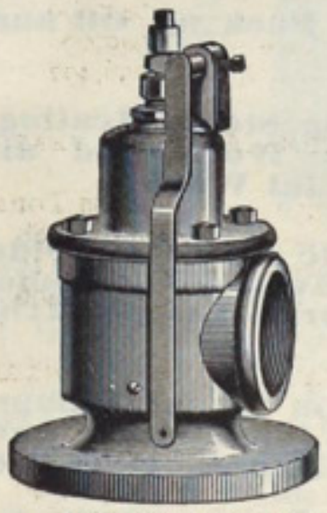

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